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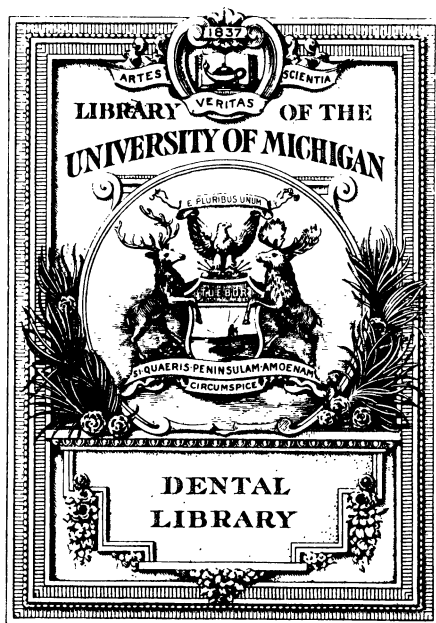
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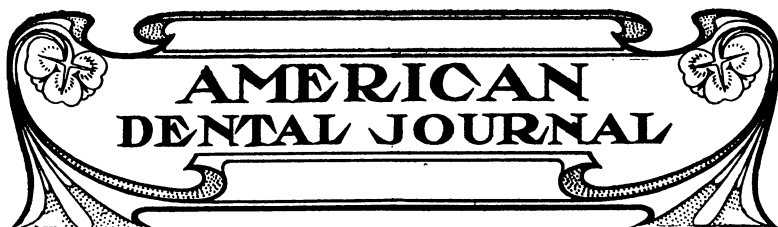
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PROSTHETIC DENTISTRY.*

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CHAPTER V.

HOW TO TAKE AN IMPRESSION.

CHAPTER II.

The subject of impressions is always an interesting theme. The profession have recognized that the scientific side of the question has been largely neglected. For years there has not been any advance relative to the comprehension of impression materials or methods of taking the impression. We have contented ourselves with matters as they are, and the result is that no marked progress has been made in this very important prosthetic work. But of late considerable attention has been directed to the subject of methods of taking impressions and points relating to scientific observations regarding the materials in general use.

An impression is a correct counterpart or reverse image of a solid or semi-solid, and is effected by means of pressing upon the object an elastic and plastic material having copying qualities.

A few general points on taking an impression should be observed:

1. Properly position the patient.
2. Protect the patient's clothes with a towel or apron.
3. Examine closely patient's mouth and determine choice of plate.
4. Select proper size and shape of impression tray.
5. Have tumbler of fresh water on dental bracket.
6. Place material in the tray and approach the patient.
7. Survey mouth, introduce and adjust tray.
8. Slowly, but steadily, press material in position.

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9. Displace lips and cheeks to permit accurate copy.

The positions of the dentist while taking impressions are as follows

In upper cases: Behind and to the right of patient.

2. In lower cases: In front and to the right of the patient.

The position of fingers in taking upper impressions:

1. Right hand, thumb resting on upper surface of the handle of the tray; index and second finger on the under surface of the tray. When the impression is properly lodged change hands so that the left hand fingers occupy the same positions just held by the right hand. This will leave the right hand for manipulation of impression material.

Position of fingers in taking lower impressions:

In positioning the tray in the mouth hold tray in the right hand as follows: Thumb on the under surface of tray handle, index and second finger on the upper surface of the tray, when the impression is about lodged, place fingers of both hands in following position: Right and left index fingers on the upper surface of the tray wings, thumbs beneath the inferior maxillary bone.

Special points on wax impressions to be noted:

1. Observe general points on impressions.
2. Heat wax in water, temperature 125 degrees.
3. Manipulate with fingers until semi-elastic.
4. Dip tray in warm water.
5. Fill tray high in center and flush at edge.
6. Wax demands strong, steady pressure.
7. Use the Richardson cup for cooling.
8. Cautiously remove impression after wax is hard.
9. Dip impression in cold water.

The special points on gutta-percha impressions are:

1. About same as with wax.
2. Heat water to 180 degrees and prepare material.

Special points on modeling compound impression:

1. Observe general points on impressions.
2. Prepare the material same as gutta-percha.
3. The compound demands but slight pressure.

The special points on plaster of paris impressions are:

1. Observe general points on impressions.
2. Fill plaster bowl partly with tepid water.

3. Add plaster of paris gradually and stir rapidly.
4. If desirable to set rapidly add a few grains of salt.
5. Mix plaster to a creamy consistency.
6. Shape mixture in the tray to conform to the general outlines of mouth—i. e., high in the middle and sunken about the wings.

To lodge a plaster impression properly, make a slight antero-posterior movement, at the same time gradually and firmly press the material into place; join heel of impression first, thus forcing excess plaster to the front.

A test for setting of plaster:

1. By watch, from two to four minutes.
2. When plaster breaks, leaving sharp edges.
3. When it is no longer plastic.

In extracting plaster impression observe the following:

1. Request patient to cough slightly.
2. Ask them to take a deep inhalation.
3. Detach heel of impression first.
4. Give tray slight lateral movements.

To obtain a perfect impression of high vaulted mouths often becomes a most difficult procedure. The simplest and best results are obtained by the method of placing on a short, wide spatula a mixture of plaster and locating it in the roof of the mouth or at such a point as may be the deepest vault of the mouth; then proceed to take the impression in the usual manner. By this method you get a most perfect impression and also simplify the process. This same idea is valuable when taking impressions of the distal surfaces and surroundings of third year molars. Often the greatest possible care does not give good results unless this method is employed. In fact, in all difficult cases I invariably add the plaster to that location and follow up with the tray containing the plaster.

A combination impression is made by taking impression in wax, as observed in wax impressions, cool wax impression. Mix plaster to consistency of cream and pour on the wax imprint, gently tap the tray, thus producing a film of plaster over wax impression. Re-introduce the tray with the combination and proceed as in plaster impression.

To facilitate taking partial impression:

1. Oil with olive or sweet oil the remaining teeth.
2. Place a band of soft wax about the teeth.
3. Do not permit the plaster to become fairly set.

If in partial cases there is danger of the plaster leaving the tray, coat the tray with sandarach varnish and cover safe with a sparing amount of cotton, then pour plaster and it will closely adhere.

Plaster will set quicker if tepid and not hot water is used in the mixture. To mix the plaster properly use as much water as your judgment directs and add the plaster gradually and stir rapidly. If you have incorporated too much plaster do not after having mixed the plaster add more, since that will destroy the effective purpose of the entire mixture. Nor if you have added too much plaster should you add more water, as a like ill effect is gotten. In such event it is better to make a new mixture, or if you have used too much water pour off the excess, but under no circumstances should you add more plaster.

The more rapidly you stir the mixture with the spatula the quicker it will set and the harder it will become.

Dr. R. Ottolengui, who has given this subject considerable study, suggests that in impressions of the mouth add a little salt and some pigment (Venetian red or Spanish brown), and these will produce a quick-setting impression material which can be readily detected from the model."

It may not be generally understood that the most desirable method for getting good impressions is to take the imprint without the aid of a tray. In lower cases where there are still a few teeth remaining it is very good practice to add the plaster to the teeth and build the plaster in the oral cavity in a manner assuring a perfect impression. By this method the impression tray is not hindering your manipulative ability and the result is a most excellent impression is obtained.

On removing the case the impression is quite generally broken, but this will not militate against the accuracy of the model, since the impression, though badly fractured and broken, can readily be replaced and the pieces thus held by sandarach varnish or molten wax, or any other substance that will tightly cement the several loose pieces will answer the purpose. It is not uncommon to have an impression come away broken into as many as twenty pieces, but if care is used in repositioning these pieces and spicula the model may not be other than very serviceable.

In lower impressions where you dispense with the tray you may get splendid results by simply using a bow of stiff metal about the size of lower tray and the thickness of a No. 8 engine burr. Incorporate this into the slow-setting and soft plaster and the metal bow will lend strength to the impression and aid you in the delivery of the impression. It is also very handy to place in the impression material a silk string, laying in in such a manner as will guarantee that it will add strength to the impression material. In removing the impression it will also assist in holding the pieces and thus simplify the task of refitting.

OPERATIVE DENTISTRY.

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CHAPTER IV.

REMOVAL OF DEPOSITS.

If one could make a rule to do any one thing before another in our attention to those who come to us for our services as dentists, the removal of deposits would be our first duty. It is our first duty and should be our rule when our patient comes and puts himself or herself in our hands to begin at the beginning and do whatever may be necessary in the order that our judgment dictates. Circumstances and conditions, however, make an inflexible rule impossible. To make a correct diagnosis of pathological conditions in a mouth all deposits should be most carefully and thoroughly removed, but we are often called upon to examine teeth or to treat some difficulty where we cannot insist on first removing all deposits, since that is a labor when properly done that takes usually the time allotted to one sitting and often to several others. It goes without saying, however, that no attempt to adjust the rubber dam or fill a tooth should be made until the tooth to be operated upon and probably adjoining ones have been attended to in this respect.

Deposits are at all times detrimental to a healthy condition of the mouth, and our patients should be impressed with that fact and also that really the first thing to do is to operate in that way. We teach hygiene as a prophylactic measure, and if it is a measure to prevent initial decay, how much more important is it when dental lesions have been subjected to man's more or less perfect or imperfect repair.

It is not upon the tooth substance of itself that deposits, or at least calcareous deposits, work their most direful injuries; and yet by inroads upon surrounding tissues, I will venture to assert more teeth are lost than by the ravages of decay, and even in this day of widespread intelligence about the teeth many of our patients do not comprehend it or realize the danger of neglect.

I am sorry to say, too, that many dentists are neglectful of impressing upon patients the importance of frequent attention to the

removal of deposits and slight their duty when they undertake the operation, and simply because it is a nasty job, to speak plainly, and they had rather fill teeth. In some offices the cleaning of teeth is delegated to an assistant more or less indifferent to thoroughness.

As to the public, there is an impression abroad, not among well-informed of course, that "cleaning teeth" is a minor affair that requires no particular skill or profound understanding. With them it is a "shine-'em-up" affair to be done in a few moments at a minimum fee. I believe I have been interviewed many hundred times by persons who I am satisfied ventured to size me up as a low-priced or high-priced dentist by asking, "Doctor, what is your charge for cleaning teeth?" as though such work had a set fee whether the conditions were good, bad or indifferent. If it costs ten cents for a shoe-shine and fifty cents to have one's nails manicured, one dollar is looked upon by many as a very fair compensation for cleaning teeth. If a higher fee is named you are put down as a high-priced dentist. In all probability the man who has a set price of one dollar for such work will do about what he thinks is a dollar's worth and then quit. In other words, he "shines 'em up."

I don't like the term cleaning teeth, and I believe it would be wise for all dentists to drop the phrase and to courteously assert that each patient *cleans* his own teeth; *we* remove deposits and treat affected parts. It is, in fact, a veritable *surgical operation*; and, mark you, should be approached and performed with all the anti-septic precautions of a surgical operation; and is it not proper that our patients should be impressed with the important difference between a real, though minor, surgical operation and a bit of dental manicuring on the exposed or front surfaces of a few teeth?

Aside from soft deposits and stains, we have two kinds of calcareous deposits, salivary and serumal, and, as indicated by the nomenclature, one comes from the saliva and the other from the serum that oozes out around the necks of teeth. Normally calcic salts of different characteristics are held in solution in these two fluids before they enter the mouth. In the new environment precipitation takes place and, lodging on the teeth, forms tartar. It is much more extensive in some mouths than in others. Salivary calculus deposits on teeth outwardly from the gum line. Serumal calculus forms under the free margin of the gums and from the nucleus

extends rootwise, and in consequence is the deposit that causes the greatest damage. If sought out and removed with suitable instruments in early stages, recovery from the slight damage done is generally pretty quick, depending somewhat upon the general good health of the patient of course; if it is allowed to remain and accumulate and extend, serious results follow, even to the loss of many otherwise sound teeth. In other words, pyrrhoea alveolaris sets in and works havoc that may not be entirely overcome by treatment which more properly comes under the conditions treated in the papers of Dr. G. W. Cook.

At the gum line there is, of course, a junction and blending of the two kinds of tartar. Serumal calculus is usually much darker and more dense than salivary, and from its damaging inroads upon the tissues surrounding the tooth it is the most important to dislodge and remove and is perhaps the oftenest neglected or overlooked by operators who are not thorough. Its presence does not show often in early stages until a searching scaler passed under the free edge of the gum finds it. Search for it should never be neglected.

It is natural, I think, for most operators to begin scaling operations on the lower front teeth. It does not matter where one begins or leaves off, only so that he works with a system that precludes the possibility of overlooking any tooth or any surface of a tooth, and especially about the necks as above noted. Some operators make it a rule to take one tooth at a time and never leave it until all surfaces have been gone over. This is a good, safe rule, but I find it more convenient for me to remove the *lingual* accumulations of a number—say the incisors and cuspids—and then turn to the labial surfaces of same teeth. When bleeding is profuse I often seek a new territory to work in for a few moments until the blood flow is reduced so I can better see my work. Some operators do all they can with one instrument and then, changing, do all they can with another. That avoids changing instruments as much as would be necessary to go over the entire surface of each tooth before leaving it. Where the lower anterior teeth are considerably separated, as they frequently are, especially at the necks, the lingual deposit may be approached often through those spaces with a push cut that does not endanger accidental wounding of the gums. It takes slender and usually curved springy blades to do this, and the ad-

joining tooth is sometimes used as a fulcrum when we may wish to pry. The ease and rapidity of dislodging tartar in this way in some cases is remarkable. No instrument should be used that will wedge in the space. There is a thin curved spring tempered blade made for this work, the curve being flatwise. For myself I have also a sort of sickle shaped instrument with four sides tapering gradually to a sharp point. It gives four sharp cutting corners—if kept sharp. It is one of my own design and is called the Tuller scaler. With it I can do more scaling (and less wounding) without changing than with any instrument I ever used, except one something like it, No. 11 Darby-Perry set. With it one may push or pull, use a lateral sweeping motion right or left, and in almost any position find a corner that will cut or scale admirably. It is in fact one of the best all-round instruments I know of, being handy for many things besides scaling, such as trimming enamel margins of cavities, trimming gold and amalgam fillings between the teeth at the cervical margins, removing temporary stoppings, exploring, etc. I have no interest in it save to have one or more always on my bracket to be used many times every day.

There are about as many forms and varieties of scalers, I think, as excavators, many of them excellent for just the one thing designed for. Some are fine and delicate and some are as clumsy as they could well be made. I believe a lot of them could be eliminated and the operator be better off with a few *good* designs. Many of our excavators are as well adapted for certain places as if designed especially for scaling. When I cannot use the instrument I have above described as a sort of universal affair, I resort more often to excavators than to another form of scaler. I keep several of this four-cornered scaler on hand, for they are well tempered and the delicate sharp point is broken off a little often, and in consequence I use up several of them in a year. When the point breaks I grind it to another and so on several times before it is abandoned as no longer useful.

As I am addressing practitioners, I do not think it is necessary to go into detailed instructions how to scale teeth, only to emphasize the fact that it should be thoroughly done, and to repeat perhaps that one must search under the free margins of the gums for that kind of calculus, the serumal, that does the greatest injury.

For dissolving out particles of calculus in deep pockets and ne-

crossed alveolus due to encroachments of tartar, I know of no better solution than a mixture of half and half sulphuric and carbolic acids, of pure quality. The mixing of the two creates considerable heat, but additional heat will facilitate the mixing, when it will remain stable. It should be inserted into the pockets with a toothpick or piece of orange wood. The sulphuric acid modifies the carbolic acid so that it is but slightly escharotic and does no serious harm if it gets on the gums or mucus membrane, but it is better to protect with cotton rolls, remembering that sulphuric acid will ruin good napkins. When cotton saturated with this medicament is left in a pocket over night it will be found to be a mass of jelly when we come to remove. It should never be left in contact with tooth substance, but a few hours at a time, as it will soften cementum and dentine.

In removing deposits the up-to-date dentist will use every precaution and means to reduce the exhibition of gore. Expectations of blood disappear from sight quickly with the fountain and other forms of cuspidors, but the towels and napkins used soon look like a butcher's apron if care is not used. Some dentists use a nice clean napkin to wipe blood, etc., from instruments. After the first wipe it looks bad and in a few moments horrible. To avoid this, use one of those large-sized short cotton rolls, pressing the instrument deep down into the center to wipe it off. It can be used over and over again before blood will show objectionably. Then turn the other end. When discolored, it can be put out of sight and a new one substituted. A bloody towel or napkin in use looks as badly the first minute as after your patient has gone and a new one coming. Avoid it as much as possible.

(To be continued.)



DENTAL THERAPEUTICS.

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CHAPTER V.

In the study of medicinal agents and agents used for the purpose of antiseptizing infected area of tissue there are several problems that, as yet, have not been explained.

The action of drugs on living matter is looked upon as being due almost solely to the chemical combination between the drug and the organic living structure. Consequently, those agents that resemble the chemical properties and physical structure of the living organism are usually looked upon as more readily combining with the living organism, and in this way bringing about certain chemical and physical changes in protoplasmia. This may be true in a certain sense, but such an action has not as yet been followed out to anything like an ultimate conclusion. Therefore, in the treatment of disease a great many factors may enter into the pathological lesion to prevent the true pharmacological action of the drug. This is well illustrated in the antipyretics, as is well understood they have but little effect on the healthy individual, but if the temperature be raised they have a power of reducing it again to the normal state. Another well-known fact is that the bromides have a very beneficial effect in reducing the convulsive seizures in epileptics, but have little depressing effect upon the normal cerebral centers.

While this illustrates some very important facts with regard to the internal administration of drugs, there are many local manifestations of a similar nature in the application of antiseptics to pathological lesions. As an illustration: It is a well-known fact that iodoform has but little if any antiseptic properties when applied to growing bacteria, and especially the pathogenic germs (however in some instances there may be a liberation of free iodine, and in this way may arrest the vegetative stage of bacteria), but it has a beneficial effect in the granulating process of tissue regeneration. At the present time most surgeons use it for the last-named purpose in connection with some antiseptic dressing, and in this way arrest the regenerative powers of bacteria, and the iodoform is used as a protoplasmic stimuli to the tissue cells.

Iodoform has been almost entirely eliminated from use by the dentist, principally by its disagreeable odor and because of its inefficient action as an antiseptic agent.

Again referring to the essential oils as used, we are forced to conclude that these agents are inefficient antiseptics, and especially do they prove so in the test tube—the only place that we have for obtaining anything like a definite data for antiseptics and disinfectants—for it was found in the investigations carried on by Dr. MaWhinney and myself, and later in a series of examinations I proved quite conclusively that in some instances with some forms of bacteria that the tubes containing essential oils increased in growth over that of the control. This is not true with all forms of bacteria, but with the majority of those that we used in the experimental work many of these essential oils increased cell proliferation for several days, when the development seemed to rather decrease than increase.

From a pharmacological standpoint these agents would have a more deleterious effect upon the cells of the higher organization, because they will penetrate the cell wall of the higher forms of cell structure much more easily than it will the bacterial cell. This is thoroughly demonstrated in the instance where its action is more deleterious upon the algae and the higher mold fungi than upon the lower forms of bacteria. It is also well illustrated from the fact that it penetrates the tissue and lessens its activity, thus relieving the pain that is so common in the hyperaemic condition of the pulp of the tooth.

We have thus far dealt with certain pathological lesions of the living pulp. The destruction of the pulp and its death produced other than by medicinal agents might be considered another chapter, dealing altogether with a reverse condition. The history of the preservation of the pulp covers a field too long to be enumerated in this connection; however, various means both mechanical and medicinal have been attempted with a hope of retaining a healthy pulp, thus preserving the physical and chemical texture of the enamel portion of the tooth. But at the present time it is not considered good practice to attempt to preserve a pulp that has been injured by mechanical means, or one in which a pathological condition has been established through the near approach of the disease known as dental caries. It is fair to presume that the cells of the dental pulp have

become more or less diseased in those cases where there has been any form of hypraemia or calcific deposits. And with the present knowledge it is considered better practice to remove the pulp and properly fill the pulp canal, which, when properly done, invariably insures a long and useful life of the tooth.

There is probably no part of dentistry that requires as much care and skill as that of destroying or properly treating a root canal and then properly filling it. I know of no other operation, if improperly done, that could possibly lead to more complicated sequels. For it is a well-observed clinical fact that the root of a tooth, though the canal may be free from any pathogenic micro-organism, has some irritating effect upon the nerve filaments that are located around or near an imperfectly treated and filled root.

As it will again be necessary to return to this phase of the subject, we will here in a brief manner take up the devitalization and treatment of the pulp. A patient presents himself with the history of having previously had some sensation in the tooth, which is not that of pain (in the stricter sense), but a feeling of discomfort; at the time of presentation the patient is suffering from a sensitive and aching tooth. There are a number of important things to be taken into consideration; first of all, the patient seeks relief, and if it were possible to know the exact stage of the pathological process it would be quite easy to relieve the patient of the pain and at the same time complete the devitalization of the pulp, but that stage is never easy to determine. The odontoblastic cells may have entirely lost their identity and the place they once occupied is a complete matrix of inorganic substance. The connective tissue cells may be but little interfered with, while the nerve cells may attract to them the toxins or those alkaloidal substances known as ptomaines, and the irritability of the nerve cells may be at the point of exhaustion.

In such cases the application of the known remedies for the devitalization of the pulp will bring about such an effect as to produce the secession of the life process of the pulp, while in another instance the products of the bacterial activity may have greater chemotactic property for the connective tissue cells and act only as a stimulant or an irritant to the nerve cells. In such cases the devitalization of the connective tissue cells would take place and cause a constant irritating influence on the nerve cells, and also cause great reflex activity of a considerable section of the nerve trunk. Of course,

there would necessarily be great pain, and inflammation might be produced in the peridental membrane; in such a case the patient would be in a very uncomfortable situation. While such a fine line of discrimination is practically impossible, the knowledge of the exact chemical and physical laws which take place in such a process as above mentioned is out of the question. But every atom of toxine or ptomain produced or liberated in contact with living protoplasmia has some chemical or physical action upon that protoplasmia.

According to investigations along biological lines, the higher the form of cellular organization the greater the increase of irritability. So we naturally infer that the nerve cells located in the pulp of the tooth would have the greatest affinity for those substances that act as irritants or stimulants to protoplasmic structure. This is well illustrated in the so-called elective affinity of drugs or protoplasmic poison. We find that some drugs have a special affinity for certain tissue; for instance, it is well illustrated that certain drugs would act upon the heart, while others act upon the central nervous system. I have elsewhere made an illustration of the elective affinity of certain toxines for certain bodily structures—that is, in the case of tetanus (lockjaw). The area of infection may not be as large as a fifty-cent silver piece, and if a tetanus bacillus be contained in that area and the toxines are carried from that small lesion to the central nervous system effecting the motor centers in the brain, the individual will lose control of locomotion, while the intellectual or conscious portion of the brain may remain normal or possibly increase in conscious activity. If that is true of one micro-organism, the biological sequel of which we are quite familiar, such a condition, though in extreme modified form, may exist in the tooth pulp.

The biological principles of bacteria as regards their relation to that pathological process known as dental caries are comparatively unknown. However, there is one important fact, and that is that bacteria are always present in dental caries. Their biological and morphological relations must necessarily undergo changes as the environing conditions change. The approach of disintegration process of the organic and inorganic substances of the tooth to the pulp makes it necessary to devitalize or in some way remove the pulp for the useful preservation of the tooth. And for this purpose various means both mechanical and medicinal have been tried,

but to relate all of these would be unimportant and out of place here.

In this connection will proceed to describe the agent that is most commonly used for the purpose of devitalizing the pulp of the tooth—arsenic being one of the common preparations for the purpose of destroying the vitality of the organic tissue in the pulp chamber. Some preparations of arsenic have been used for therapeutic purposes since the early part of the Christian era. The metallic arsenic is insoluble in water and will pass through the alimentary canal without undergoing any material change. However, it has been observed that small quantities may become oxidized in the stomach into arsenious acid. The effects of the metal has been observed when rubbed upon the skin when finely sub-divided. This is due to the absorption of an arsenious oxide. There are two forms of this metal which are very absorbable and is a protoplasmic poison. They are known as arsenious acids (AsO_3H_3) and the anhydride (AsO_2S_3). This last named substance is supposed to exist in the tissues as arsenites. There is, however, another formula that is less absorbable; it is the salt of arsenious hydrides (H_3AsO_4). This substance acts more slowly and is less poisonous than the arsenious acid. These compounds do not all exist in the tissues as chemical compounds of arsenic, but they readily go into division; in other words, they are easily ionized. Consequently the ions of the metal arsenic are easily liberated and readily attacks the proteid molecule, changing it into others forms, thus destroying the irritability of the protoplasmia.

There has been considerable discussion pro and con as to just how arsenic acts upon the dental pulp. It is claimed by some that it acts as an irritant which causes strangulation of the pulp; others consider it as a protoplasmic poison to the pulp tissue, but if the pulp tissue is in a healthy state it acts as a protoplasmic poison, due to its chemical combination of the proteid molecule. But there is that factor to be considered in the application of a remedy for the preservation of the pulp, and that is just what activities, both chemical and physical, has been going on in the proximity of the tooth pulp. There are certain conditions of the pulp when arsenic has been applied that the arsenious acid readily goes into solution, or, in other words, becomes disassociated and the ion of the arsenic is liberated and at once attacks the ion of some other substance for which it has the greatest affinity. If this happens to be the proteid molecule, of

course the devitalization takes place very rapidly, but if there happens to be some other chemical substance formed by the actions of bacteria in the dentine that combines with the arsenious ion more readily, then the action of arsenic on the pulp has but very little effect other than an irritating effect.

The pharmacological action of arsenic on protoplasmia has been fairly well demonstrated, and in brief the action of arsenic on the dental pulp is due to its being a protoplasmic poison. As a whole its irritating properties are far less potent than many of the other agents that are sometimes used for the purpose of devitalization, because it is found that the tissue of the body will contain, or, in other words, tolerate, considerable quantities of arsenic. If the administration is started in with small doses and the quantity is gradually increased, the individual will soon reach a state in which the large doses can be tolerated with impunity.

It would be quite out of place to go into a detailed description of arsenic in its various phases, but there are certain phases that should be understood in order that a broad, liberal understanding may form the basis of the true conception of its proper use when indicated. The action of arsenic on the blood is yet an unsolved problem, although it is administered in certain forms of anaemia and chlorosis.

In this last named disease and in persons in a healthy state the number of red corpuscles are decreased, but the hemoglobin remains the same. Engel in his study of pernicious anaemia came to the conclusion that the newly formed corpuscles were increased, while the older forms were diminished.

It would be quite out of place to discuss all the opinions upon the subject of just what effect arsenic has on the blood and the blood-making organs; suffice it to say that the weight of evidence shows that it has but very little effect upon this constituent of the body.

Arsenic and phosphorus both have a great influence on the metabolism of the body, and especially when administered in poisonous doses. Investigations show that the nitrogen in the urine is somewhat increased, but whether it is due to urea or some other nitrogenous substance is yet an unsettled question. It is also believed that the ammonium is increased and that the presence of lactic acid in the urine is also observed, which may also account for the alkalinity of the blood in those cases of arsenical poisoning. That arsenic has an effect on the liver is no longer a question, because this

organ seems solely incapable of changing the sugar which is taken in in foodstuff into glycogen.

Arsenic has the property of producing, when its administration is long continued, fatty degeneration of all the tissues of the body, especially of the epithelial lining of the stomach, intestines, heart, liver, kidneys, muscles, blood vessels, etc. And the only explanation that has been given is that it lessens the oxidation process. It has been and is at the present time a question whether or not arsenic may increase the growth and nutrition to any great extent or not. It has been observed that those people living in districts where ore is being mined containing considerable quantities of arsenic usually are short lived, dropsical and very prone to infectious diseases. Arsenic is usually excreted by the urine. Traces are eliminated of the perspiratory mucous membrane, skin, hair and milk. It is a well-demonstrated fact that it remains in the body for a considerable time after its administration has been stopped. It has even been found in urine where arsenic has not been administered. Deposits of arsenic have been found in the tissues of the kidneys, liver, spleen and lungs. Arsenic has a deleterious effect on the lower forms of life, with the exception of that of the mold, which is capable of growing in a fairly strong solution.

Persons who have been supposed to have died from arsenical poisoning are said to decompose very much more slowly, because of the antiseptic power the arsenic has in the body; in other words, if there is enough arsenic in the body mummification will take place instead of decomposition. This is probably a state that sometimes takes place in the pulp of the tooth when arsenic has been administered, and the main body of the pulp has become devitalized and embalmed and the devitalized portion remains intact with the living portion, thus being able to produce all the painful sensation that is sometimes found in the living pulp.

(To be continued.)



PORCELAIN INLAYS.

BY F. EWING ROACH, D. D. S., PROFESSOR OF PORCELAIN DENTAL ART
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Chapter I.

That the dental profession is on the crest of the inlay tidal wave is evidenced by the large number of articles on the subject that have appeared in the journals within the past few years. And a perusal of the various society programs from all parts of the country reveals the fact that the porcelain inlay has been given a prominent place and is usually the center of attraction.

What is the cause of all this furor in the dental world over this new filling material? Is it only one of the many fads, here to-day, gone to-morrow, or has it virtues that will make it enduring?

The enthusiast sees no limitation to its applicability, but, on the other hand, the ultra conservatives see nothing but disaster and ruin following in its wake. And they predict that within a few years our inlay equipment will be placed upon the shelf with the cataphoric and other abandoned apparatus, bearing in mind, if not in fact, this inscription—"With regrets."

While it is not my purpose to attempt to establish the status of the porcelain inlay by any argument I may produce or by any improved means or methods of manufacture, I hope to add something in support of this admirable filling material and to make a plea for *conservatism* in its use and *consistency* in our claims.

That the porcelain inlay has come to stay and that it is to fill a wide field of usefulness is now admitted by many of our most careful and conservative practitioners and teachers.

Dr. C. N. Johnson in his second edition "Principles and Practice in Filling Teeth" (page 166) says "that while inlays have not been sufficiently long in general use to establish their precise status in permanence, yet the recent advances in their manufacture would seem to give hope for an extended field of usefulness."

It has been and is still argued by some that the cement with which inlays are secured to place is an element of weakness and that in the course of time the cement will be dissolved out in toto or to such an extent that recurrent decay will take place and thereby necessitate early repair or replacement. This was used for many years as the strongest argument against the inlay, but the fallacy

of this theory has been proven to all who have taken pains to thoroughly investigate this phase of the question.

Again referring to Dr. Johnson's article on inlays, I believe that he strikes the keynote when he says: "The chief source of danger to inlays is the crushing of thin margins and bodily displacement through masticatory forces." It is my opinion that the greatest danger is *bodily displacement* through lack of mechanical retention. *And as long as we depend upon adhesion of cement for retention, just so long will this element of danger prevail.*

What is more preposterous than to expect a large mesio proximal restoration of a superior central incisor, which extends from the cervix to and including a portion of the incisal edge, to resist bodily displacement if only the adhesion of cement is depended upon? What could be a more flagrant violation of the laws of physics and of common sense? Yet there are a great many who are making inlays on just such principles and then wonder why their inlays drop out. But the wonder is why they stay as long as they do.

In this connection I will say that it is my belief that some of our experts in this line of work are responsible for much of the haphazard and promiscuous use of porcelain. In their enthusiasm they make some very sweeping statements, and coming as they do from men who are recognized as experts and authority, they are all the more damaging. The enthusiast is always a dangerous man to follow. Though an essential in exploiting any new cause, he usually proves a menace as well to its permanent and successful establishment.

As an example of these sweeping statements I will refer to some of those made by our own Dr. W. T. Reeves of Chicago.

In the May issue of the *Dental Review* he makes this broad statement: "There are scarcely any cavities where gold can be utilized that porcelain cannot be successfully used, and there are so many places and conditions under which gold cannot be used and where porcelain will be a perfect material with which to restore lost tooth structure that I place it first in point of applicability." This is a very broad statement, and while it may be literally true with such an expert as Dr. Reeves, I believe that such a claim, just at this time, will have a damaging rather than a beneficial influence. Be this as it may and granting that it may be true, he makes other statements with which I must take issue.

In the same article referred to above occurs this statement: "For those bordering on nervous prostration and those high-strung nervous temperaments, for whom it is a physical impossibility to prepare a cavity even for a cement filling, to say nothing of gold, you can do permanent work with porcelain."

It has not been my experience, nor do I believe it possible for any one to properly prepare any cavity for an inlay with less discomfort to the patient than would be incurred in the preparation of a cavity for a cement filling. There should be no ground left for the belief that cavity preparation for inlays can be done in a careless manner, for surely there is no cavity preparation that is more exacting in its requirements than that for the successful porcelain inlay.

On page 428 in the same article occurs this statement: "After the cement is completely crystallized a thin porcelain filling in the occlusal surfaces of molars will have the full strength of the whole tooth to resist masticating stress and is in no danger of fracture." Were this and his new law of physics referred to in his closing remarks literally true the success of the inlay would be settled absolutely.

In his closing remarks he says that he will give us "a law of physics that has not been understood or appreciated by inlay workers." And after a few deprecatory remarks about inlay workers who are working along lines of self-retentive forms of cavity preparation, he says that "I believe inlays depend upon the law of close adaptation for their strength of retention. Close adaptation and the medium of completing the close adaptation crystallize under pressure." He attempts to further strengthen his theory of adaptation as a means of retention by reference to the adhesion of two plates of glass in apposition with water between to exclude the air, and to the joiners glued joint.

Let us analyze this law of physics that we have not understood or appreciated. In the first place, the doctor does not state any law of physics as he agrees to do. He does not state whether the inlay is held in place by adhesion, cohesion, atmospheric pressure or what. But, considering his reference to the sheets of glass and the joiners' joint (neither of which, however, have any significance in showing the laws of force governing the retention of an inlay), we presume that he depends upon ad-

hesion combined with that of atmospheric pressure for retention. It is a fact that the adhesion of two perfectly adapted plates of glass is about 15 grains to the square inch, and that by excluding the air with water we increase the adhesion to some extent by atmospheric pressure.

Granting that these two forces exist (but they do not), and that we obtain their maximum strength (15 grains adhesion and 15 pounds atmospheric pressure), it is at once apparent that *these* laws of physics should receive no consideration in connection with the retention of inlays.

As to the joiner's work, I will ask one simple question. If perfect joints with a minimum amount of glue affords sufficient strength of attachment of one piece of wood to another, why does the joiner resort to and depend almost entirely upon dovetails, dowels, screws, nails and the various other mechanical means for strength in his joints?

While admitting that there are many cavities into which inlays can be securely anchored without self-retentive cavity formation or pins, I am unalterably opposed to their abandonment, and, on the other hand, insist upon their employment when any appreciable strain is brought to bear upon the inlay.

Note.—My next article will be on cavity preparation for porcelain inlays, with illustrations.

(To be continued.)



ORIGINAL CONTRIBUTIONS

PRESSURE ANAESTHESIA.

T. ELHANON POWELL, D. D. S.

In these days of crown and bridge work the importance of the preservation of devitalized teeth cannot be overestimated.

The time was when to devitalize the pulp of a tooth except when exposure had occurred was frowned upon as a near approach to malpractice. Indeed, strong efforts were frequently made to preserve the life of the pulp even after it had been laid bare.

But now, throughout the country towns, they have "slain their thousands" and in the cities they have "slain their tens of thousands."

The importance of this work is emphasized on account of the use to which the saved teeth are put. Restoration by crowns and substitution of lost teeth by bridge work is successful only when the roots are treated that time, chemical and bacteriological changes do not cause deterioration. That tooth which is forced to do the work that should be done by three or four teeth must be unusually strong and healthful if it does not sadly disappoint him who depends upon it.

If I have been correctly informed, many failures have occurred which were inexplicable to the operator, he having used every precaution usually observed by a careful and skilled man; but in spite of care and skill much trouble and not infrequently dire failure has followed his efforts. Devitalization was ordinarily brought about by the arsenious acid method.

Now, arsenious acid is one of the most potent and far-reaching poisons known to the pharmacist; so potent, in fact, as to manifest its influence upon persons with the arsenical idiosyncrasy to such an extent that when said persons sleep in a room papered with a green paper marked symptoms of arsenical poisoning have followed. Other persons have had pronounced ill effects from the handling of certain art goods, such as artificial flowers, glazed papers used in kindergartens, carpets, etc.

It is not known just how the poison enters into the system, but Gasio advances the theory that either solid particles become de-

tached and come in contact with the individual or gaseous volatile substances are formed from arsenical organic matter by the action of several molds, notably, *Perniculum Brevocae*, *Mucor Mucedo*, etc. Dr. Sanger suggests that in moisture at a temperature of from 60 to 95 degrees F. a volatile compound is set free; probably "an organic derivative of arsenic Pentoxide."

The chronic poisoning from some fabrics may be due, according to Sanger, to *ingestion of minute continual doses of the derivative*.

There are many symptoms accompanying arsenical poisoning, one writer giving as many as 375. A knowledge of all these symptoms is not necessary to the dentist, but I will mention a few.

Austere taste, fetid state of the mouth, frequently typhism, continual hawking, constriction of the pharynx and oesophagus, sensation of teeth being on edge, hiccough, nausea, anxiety, frequent sinking, burning pain at the precordia, inflammation of the lips, tongue, throat, palate, bronchii and oesophagus, irritable stomach, cannot support the blandest of drinks, vomiting a brown or bloody matter, black, horribly fetid stools, small, frequent and concentrated pulse, sometimes irregular, palpitation, syncope, insatiable thirst, burning heat over the whole body or a sensation of icy coldness, difficult respiration, cold sweats, suppression of urine, change in the countenance, a livid circle around the eyelids, swelling and itching of the whole body, loss of feeling, especially in feet and hand; delirium, convulsions, often accompanied by insufferable priapism, falling of the hair, nails, cuticle, etc.

Of course no one patient will have all of these symptoms. The ones which interest us are confined principally to the oral cavity. Ofttimes, however, general symptoms follow local poisoning.

You may say, "Why all this about arsenic in an article on Pressure Anaesthesia?" I believe that many dentists use arsenic too indiscriminately and often very carelessly, and in order to strengthen what I have to say about Pressure Anaesthesia I have shown the dangerous nature of arsenious acid.

Manifestly, if arsenic be so dangerous immediate removal of the pulp should be practiced whenever it can be done with a minimum amount of pain.

We have all gone through the repeated treatings following the arsenic method; placing the acid in the cavity, leaving it there for 48

hours only to find on opening, the pulp more sensitive. We have placed the patient under great inconvenience, wasted much of our own time and materially increased the chances for infection.

In Pressure Anaesthesia, after the application of the rubber dam, if the nerve is exposed and has no wall on all sides of cavity, the first thing to do is to build up a wall, so that direct pressure may be obtained without losing any force laterally.

If there be no exposure, with a small, sharp, round burr make one. If the tooth is intended for an abutment to a bridge, and has no cavity; first make cavity with medium large burr almost to the pulp chamber, and then with a small sharp burr continue to the pulp chamber with a quick thrust.

Unless the dentine be very sensitive this operation can be accomplished with very little pain. Should the dentine be supersensitive, begin pressure as soon as exposure of dentine has been obtained. A saturated solution of cocaine and chloroform may be used on the dentine, Tuller's instrument being very convenient at this point of the operation. When access to the pulp has been gained, a small pledget of cotton dipped into the cocaine solution should be placed in the cavity and with a soft piece of rubber, pressure should be brought to bear, gently but insistently, until the patient fails to respond to the pressure.

Let the pressure be cautious and easy at first, gradually increasing until much force is exercised, using the force up to the point where pain is induced. Should the patient give evidence of discomfort reduce the pressure. Continue this process until insensibility of the pulp is obtained, when with a barbed broach the apical end of the pulp may be entangled and the entire organ removed.

Wash out the pulp with peroxide of hydrogen; use campho phinique to stop hemorrhage; flood canal with eucalyptus and finish root canal filling before patient is dismissed.

The campho phinique is used for two purposes. First to check hemorrhage, and second, to act as a mild cautery to the terminal end of nerve at point of separation.

I have heard much complaint from soreness after this operation, but rarely have any complaint after use of campho phinique.

Ordinarily this method saves time, is more scientific, minimizing danger of infection, and the results are accomplished with much less pain to the patient.

TOOTHsome TOPICS.

By R. B. Tuller, D. D. S.

"Doctah, what is the latest style in false teeth? I've been wearing a plate for some time, but it has become quite loose, and I shall have to have a new one, I think. What is the *very best*?"

"Madame, there is no style in any false teeth except the continuous gum. *There* is something *stylish* and *artistic*."

"And what is the price, Doctah?"

"Well, Dr. Jones of New York will not make a plate of this kind short of \$500.00, and he has always admitted that *I* could do a much finer piece of work. I know you want the best and most stylish, Mrs. Dashington, or you would not come to me. For you, Mrs. Dashington, I shall have to make the price \$300.00."

"That is very reasonable and very kind of you, I am sure, doctah. What else have you in false teeth? Haven't you something in gold? What will a gold plate cost me?"

"I can make you a fine gold plate, madame, for—well, for \$250.00 to you. I usually get \$300.00 for them."

"And you make them of other material? I think I have heard of aluminum. Aren't they very nice, doctah?"

"Well, of course we make some of aluminum with rubber attachments, but I hardly think you would consider them good enough for you, Mrs. Dashington."

"What is the price, Doctah?"

"Well, to you, Mrs. Dashington, \$100.00; but really I would recommend the continuous gum—porcelaine—as the most desirable for one in your——"

"My mother says she had several different kinds of metal plates and none of them was as satisfactory as one made of rubber. Don't you make rubber plates?"

"O, yes, sometimes; but rubber would never do for you, Mrs. Dashington. Of course, there are people who can't afford anything else."

"What is the price, doctah?"

"I will make you a rubber plate for \$75.00, but——"

"Seventy-five, doctah? Why, mother only paid \$8.00 for her's and you'd never know they were false; they look so natural. I don't think I would pay \$75.00 for rubber."

"But I want to talk to you also about fillings, doctah. I have quite a number of my own teeth yet, and some need filling. What is the latest and best in fillings, doctah?"

"Porcelain inlays, madame, are the latest and best."

Porcelaine inlays! What is the outlay, doctah?"

"From \$20 to \$50 each, Mrs. Dashington. They are all the rage. I put in four for Mrs. Goldbug, a neighbor of yours, and I am removing all the gold fillings in the mouth of Mrs. Bondsworth, in the next block above you, and putting in porcelain inlays. She won't have anything else."

"Aren't gold crowns on front teeth in style any more? I thought some of having a gold tooth here" (indicating).

"Well, they are going out of style a good deal, madame. I don't put on half as many as I did two years ago. No, madame, the porcelaine crown or porcelaine inlay is *the* thing now, but of course there are but a few of us really capable and artistic in the work; especially porcelaine inlays. Some dentists still put on gold crowns and put in gold fillings, because they can do that better than they could do porcelaine work. There are but few of us up on porcelaine."

"I don't like to have gold pounded into a tooth; it takes so long and is so tedious. Do you think silver would show much in this tooth?"

"O, Mrs. Dashington, we never put silver in front teeth!"

"What could you put in there that wouldn't take much time? I really cannot stay much longer. I have to meet my daughter at Field's at—let me see—why, in twenty minutes. Can't you fix this tooth temporarily in that time? I think I will have inlays put in later. Yes, a little cement will do. It don't show much, any way. I've had cement before. It isn't bad."

* * * * *

"O, that looks very well, doctah. Two dollars! Why, I don't think I paid but one dollar before. Well, you send your bill to Mr. Dashington. I can't decide to-day about the plate. Mother wants me to go and see her dentist. He does do nice work. How much did you say, doctah, for rubber?"

"Well, there are all sorts of prices on rubber, but——"

"I know that. I see them advertised as low as \$3.00. My! there is a difference between that and \$75.00."

"Well, of course, that is for *my very* best, and when I give my *personal* attention to all the details. You don't want any cheap teeth, Mrs. Dashington."

"No, I don't want cheap ones, but mother's look so nice, and only \$8.00."

"Well, I can make a set for \$15.00, but——"

"Well, doctah, if you can guarantee me as good a set as mother's for \$15.00 I think I may have you make me a set, next week, perhaps—possibly not till next fall. I'll see. I don't mind *that* difference if I get a real nice job. Good day, doctah."

"Good day, Mrs. Dashington. I trust you will feel that I can do quite as well by you as any one, and perhaps when you think it over you'll want the best. Good day, ma'am. Good day. Ahem! Good day!"

(Alone.)

"Well, I'll be jiggered! *! *! Visions of six months' rent gone down to 'two plunks' on the books! Wouldn't it jar you! *! *! If it wasn't for injuring innocent people with falling glass and so forth I'd kick out a window and throw a lot of things through the hole! Gee whiz! 'What's the *latest style* in false teeth?' Wouldn't that make you woozy! Dentistry is a cinch—Oh, yes! *! *! *! *! I'm going out and get—a glass of buttermilk. Me for the buttermilk!"

(To be continued)



CAVITY PREPARATION.

D. J. HEISEY.

(Extract from paper read before the Cedar Rapids Dental Society.)

Under the subject of cavity preparation is included all those operations required in the removal of matter from cavities formed by decay, the forming of the cavities for the reception of fillings and such extensions and preparations as will best fit the affected surfaces of the teeth to resist decay in the future. There are certain fundamental principles that are general to the excavation of cavities of the teeth, the observance of which will simplify and facilitate the operations.

This procedure is to obtain first, the required outline form; second, the required resistance form; third, the required convenience form; fourth, the required retention form; fifth, the removal of all remaining decayed dentine; sixth, the correction of the form of, and the making smooth of the enamel wall and the beveling of the cavo-surface angle.

By the outline form is meant that area of the tooth surface to be included within the outline or enamel margins of the finished cavity. The laying out and cutting to these lines should be the first thing considered and accomplished. The difference in treatment of smooth cavities on clean and unclean surfaces was considered and different methods explained.

In habitually unclean areas it is often required that sound enamel and dentine be cut away to obtain the required outline form and to prevent further decay there.

The resistance form is that shape given to a cavity intended to afford such a seat for the filling as will best enable it to withstand the stress brought upon it in mastication. The retention form is the provision for the filling from falling out. This is usually done by a sort of dovetailing process, leaving a step to keep the filling in place.

The finishing of the enamel wall and the beveling of the cavo-surface-angle is the last cutting to be done in the preparation of the cavity. A rule that must be followed in the preparation of a cavity for a gold filling is to let no moisture of any kind enter the cavity after the last cutting is done, and if by accident any portion of the cavity should become wet, it should be dried thoroughly and then that portion that has been damp should be freshened by cutting away the surface.

HYPER ANAESTHESIA.

BY DR. AUSTIN C. HEWETT, L. L. B., M. D.

In my last article I made a large promise—one that some of my readers may deem reckless.

First, "The Way to Absolute Pain Avoidance"; and

Second, "The Way to Comparative Pain Avoidance"; and

Third, "The Way to Safety."

These three I promised to point out, and I will try and make my pledge good.

First, the way to absolute pain avoidance through anesthetics, I care not by what name you call them, is the way to death; that the end of the way is not always reached when anesthetics are produced so profound, deep and prolonged that consciousness and sub-consciousness (of which latter I shall speak later on) is overborne, and that condition prolonged for hours, is due to a tenacious clinging to life, sometimes strikingly exemplified in old age and in infancy and in patients wasted by disease; but that power to hold on to life thus is not a universal possession—is in no sense a visible asset of human life and should never be presumed upon. "Heart failure," so named, and shock of operation all too often follow and are so reported. Such "heart failures" from super-anesthesia are much more frequent than is generally supposed and occur much too often to contemplate with complacency, in view of the fact that at any day each of us are liable to accident that shall send us to some hospital, to the operating table and to "heart failure."

I ask my readers to turn to my former article and re-read from the tenth line on page 363 concerning where death begins in profound anesthesia, so profound as to cause a loss of sensation and so deep as to hold in abeyance muscular contractility, so loth to surrender and so strikingly manifest in carcasses of animals slaughtered, flayed, quartered and hung in the "cooler." I ask you not only to re-read, but carefully note the point and the lesson I would teach. Did you ever stand by and watch a drowned person brought back from insensibility to conscious life or one asphyxiated in mephitic gases or from strangling? Did you watch, as I have, over a drowned brother for the tremor of an eyelid, to catch the first moan incident to the agony of resumed respiration and re-establish capillary circulation? Were either of you ever drowned and restored

by artificial respiration and applied stimulants, and do you remember the torment of agony, the first full breath of cool air brought to your returning consciousness? No? Then I fear I shall fail to make you understand the lesson I would teach, as I wish you to learn it. I have been drowned and thus restored. I have a memory of the intense torture of resuming life, somewhat dulled by passing years, but yet keenly alive to recall the intense, all-pervading lassitude and weariness that was consequent upon the shock of asphyxiation. Whence and wherefore the shock? Was it the water on tissues of trachea, bronchia and pulmonic air cells? No, for the sensation caused by the entrance of the water in my lungs was a pleasant one physically, and the whirl of dizziness and pressure of brain was devoid of pain and my sinking to the lake's bottom and into unconsciousness was like falling into slumber. I remember it as of yesterday instead of sixty years ago. The shock came from nerve fibrilla, trunk and ganglion, from cell, capillary, arteriola and veinlets, from the spasm of functions springing from the abyss of lethargy into which they had been thrown. Why do I relate this bit of personal history? Do you think I care to exploit self and personal experiences? Far from it. Drownings and asphyxia but illustrate the overwhelming of life's forces by too deep and too prolonged and unintermitted anesthetics.

No, drownings are everyday affairs, as are deaths from hyperanesthetics and the shock of them. I am but a speck upon the ocean of life. I would rear an argument behind which my personality should be shadowed; I would swing a red light of warning across this "way to absolute pain avoidance." It is an easy way in gradient and surfacing, hedged in, shielded from the sight of a trusting duped public; only a bottle of lethal drugs, a mask and the hand of some interne to lower the mask, death-laden as it is, closer to the mouth of the patient, obedient to the behest of the skilled surgeon that his patient shall not flinch under cut of bistoury, thrust of catling or rasp of saw.

Reader, do you wish to risk a tour over that way, to verge of death, always imminent? Then find some surgeon that shall scientifically drown you in water, operate and then resuscitate you if he can. It will be an equal surgical success and not one whit greater in risk than drowning you in ether or chloroform and holding you under for an hour and forty minutes. To my mind the criminality

of each method are equal. Both might be classed as hyper-anesthesia and is *never* necessary, *never* safe. A couple of cases in contrast and illustrative of the second way, "Comparative Pain Avoidance."

Mrs. ———, now a resident of a charming suburb of Chicago, brought to me her little son, aged about four years, seeking my advice. The case was one for surgical interference. I so advised, declined to operate, but named a surgeon in whom I had and have implicit confidence. She readily acceded to my selection, but she added: "I want you to assist and give the anesthetic." She had been a patient of mine and was familiar with my views and practice with chloroform, having taken it for pain avoidance in dental operations. The surgeon pleasantly accepted my assistance, and together we drove to her home for the operation as appointed. Dr. ——— chose to produce the initial anesthesia, and none could or can exceed his skill, care and success. No hyper-anesthesia was produced, but instead a sweet, restful, apparently natural sleep. Giving the drugs and mask into my hands, he proceeded to operate. At the first stroke of the knife the patient's little legs drew up and his head rotated, but the mask soon found the range of inhalation, and I said to the surgeon, "Go on, he won't feel the pain." Very deftly and skillfully the doctor went on with his cutting, I holding the head and the father holding the legs. The operation took, as I remember, about forty minutes. Intermittant muscular movements were attempted by the little patient, but the strong grasp at the head and heels and the light narcotism that I caused enabled the surgeon a fair chance to work, though he called for deeper sleep. My administration of the anesthetic was intermittant, thus occasionally giving the boy pure air and consequently a modicum of oxygen. Consciousness of pain was entirely lulled, a sub-consciousness of operating going on retained, and his struggles would have been embarrassing to the surgeon had not that same sub-consciousness recognized grasp on head and legs and convinced his intuition that struggles were useless. He was a willful little scamp of a very pronounced type.

The wound was dressed, the surgeon gathered his instruments and, turning to the father, he said: "The little fellow will sleep a couple of hours probably, but let him rest as long as he will." I did not believe he would sleep a half hour and, wondering which guess would be the better, turned to leave. Before reaching the hall a clear trebled "Ma! ma!" rang out. "Ma" was in an adjoining

room enjoying the luxury of a "good cry" over success, but rushed in to hear, "Ma, I want a drink of water." Surprise halted us all; and turning, we saw apparently as broadly and brightly an awakened urchin as he has ever been since. The doctor gave a puzzled look, and, turning to me, said: "Let us go." I wish the reader to bear this little incident in mind to parallel other statements and evidences of rapid restorations from whatever shock is caused by either operation or anesthetic or both, and as refutation of the doctrine of shock under "partial anesthesia." (?) The boy was very fond of me and later, during an uneventful recovery, I asked him if the operation hurt him. "Nope, I didn't know you did anything," was the instant reply.

Second Case.—A middle-aged woman of Chicago had been operated on for rectal disease of a serious character. At the time of the operation she had been fully anesthetized with both ether and chloroform and was entirely unconscious during the operation. Immediately after the operation she remained unconscious for about ten hours. The surgeon said shock of the operation was the cause and that she would probably die as result of shock. The next day, however, she regained consciousness, only to be seized with pyelitis and vomiting of a serious pertinacity. Subsequently the same surgeons decreed a second and supplemental operation. She dreaded the anesthetic and its sequelae. Her husband applied to me to give chloroform. "Your way?" I said. "Yes, if you will get Dr. ——— to operate." "All right; he is the one we want." At the appointed time surgeon, trained nurse, anesthetist and patient met. On examination I found pulse rapid, heart action weak and an intermitting respiration at least one-third too rapid and one-half too shallow. I regarded the case as a very unpropitious one for successful anesthesia. After placing one-thirtieth grain atropin sulph. and one-sixtieth grain stropenthin sulph. well back on the patient's tongue, I placed her on the operating table in a semi-sitting posture, the body about the region of the thorax and the head and neck about an angle of 45 degrees, at the same time telling her that for no consideration would I produce full profound anesthesia. "Why?" she asked. "I do not deem it safe," I replied. "You must trust me; I will free you from acute pain, but not of consciousness, perhaps not entirely from pain, but it shall not be severe. You must obey me or I will have nothing to do with the case." She responded, "I will try."

Slight anesthesia was easily procured. The thrust of a quad-rivalve speculum of large size seemed to cause pain and a straightening of the right leg attested discomfort. I sternly bade her lie still, gave her a little more chloroform, carrying the drug to what I deemed scant analgesia. She obeyed, and thence on gave no sign of pain. As I recall the occurrence, the time of the operation did not exceed thirty minutes after insertion of the speculum. About mid-way of the time the surgeon surprised me and doubtless the patient by asking, "When was your youngest baby born?" Without the least hesitation she replied, giving years and months, which I do not recall. Immediately at the conclusion of the operation the patient started to get down from the operating table. I bade her lie still for a few minutes. In less than ten minutes she said, "I am fully recovered from the chloroform," and got down from the table, walked to a lounge near by and sat down, and in a few minutes afterward put on hat and gloves, walked two and a half blocks to her home, protesting that she felt better than when she came. Her husband told me afterward that she experienced no inconvenience from either operation or chloroform, and that during the single moment spoken of above only was there any pain, and that a dull, "bearable sort of hurt," she added. Tell him "if I have to be operated on again and can get him I shall want it in the same way."

In passing I wish the reader to note that there is no other part of the body so difficult to operate on painlessly as is the lower bowel. This fact, though recognized by all surgeons and anesthetists, has so far, to my knowledge, never been explained. So general is this belief that I had never before had the courage to test the sufficiency of analgesia in orafacial surgery. While the success in this case was gratifying and suggests study and experiment, I will not urge it as conclusive proof.

Mention was made in this case of an opinion of the surgeons first operating that the patient might die from the shock of the operation. This matter of "shock" needs more than a passing notice. Indeed it is a subject far too important and needs greater elaboration than is permissible in a magazine article. I can only dogmatically present views upon the point without extended arguments. Some further illustrations I shall give, and afterward give proof of the correctness of my theory and safety of practice.

The best definition of shock I have been able to find is given in

Dungleson's Medical Dictionary (21st ed.): "Sudden or instantaneous depression of organic, nervous or vital power. This is primary shock and is consequent upon a severe injury or some overwhelming calamity. Sudden joyful or disastrous news, a fall from lofty heights, limbs crushed under car wheels will cause primary shock, and death ensuing immediately or after minutes, hours or days. Primary shock may also be caused by unskillful administration of chloroform and 'laughing gas,' though this latter fact is not generally known. Deaths from etherization never occur as with chloroform at the point of first or early inhalation, but from exhaustion of vital forces by reason of prolonged stupor and interrupted capillary circulation and paralyzed nerve centers. This can in no just sense be called secondary shock, and is generally characterized as 'heart failure and shock of operation.'" It is a remarkable fact that when shock from an early administration of chloroform is present it is always and speedily fatal. Restorations and resuscitations, though often attempted, I have never known to be successful. Death comes more speedily than can be produced by bullet, bludgeon or knife. Another curious fact: I have never known a nose-breathing animal killed in the early stage of inhalation. I have often tried on such, but death only would follow profound and prolonged anesthesia. In mouth breathers it is easy to put out life, and that very speedily. Death by reason of shock of *operation* under partial or early stages of chloroform giving is a *myth*. I "stand pat" (to use an emphatic phrase now popular) upon denial of any danger in operating under "partial anesthesia" not imminent if no analgesia were present.

Partial anesthesia is a solicism when applied to a condition produced by "laughing gas, ether or chloroform," and never should be used. Stages of anesthesia is an equally incorrect description of conditions so produced. Anesthesia, privation of sensation and motion (an aisthanomai), amalgesia, insensibility to pain, but not unconsciousness to tactile or other impressions. Ibid: Topic analgesia.

Analgia, by the use of chloroform purified and kept pure, is the way to "comparative pain avoidance," and third, "the way to safety." There is no way to safety when any anesthetic is used and carried to complete insensibility and prolonged for an considerable

time. Danger is always imminent. And it should never be produced except at the bidding of the most imperative necessities. If such necessity occurs then the most consummate skill alone should be put into requisition. The drug should be given intermittently. Oxygen, or at least pure air, admitted in the interim. Give the patient some chance. More of this later on. The anesthetic in this latter case should only be administered by one thoroughly versed in anesthetics, and in pathology, symptomatology, in signs of collapse, syncope and true heart failure, in facial changes signaling danger, and that after a due preparation of the patient for a severe call upon the resistive forces of life. Attainments and skill equaling, if not transcending, those of the most successful surgeon should always be required. To put in jeopardy the life of a human being, when not thus prepared and equipped, is a little if at all less than criminal. Anesthesia proper is never required unless disease or accident has more or less weakened the powers of the patient to resist shock of the anesthetic and shock of the operation; and it is monstrous that a surgeon should select or allow any one—student, physician or interne—to officiate unless competent.

To produce the analgic influence of chloroform sufficient to obviate all *pain* is comparatively a trivial matter, readily learned and safely practiced. I make the last assertion, weighing every word, having had personal experience with and careful study of chloroform for more than fifty years. I have during that time personally administered chloroform more than twenty thousand times without a single death or collapse resulting. These administrations were not hidden in a corner. Nearly twenty of the fifty years I operated in an office open to the public at 491 West Adams street, Chicago. Many of my competitors and confreres now living were cognizant of my practice in pain avoidance; some of them honestly thought and prophesied that disaster would overtake me and give grief to them, for they were friends. But no disaster came, and as I look back over all those years more of reverent gratitude to a shielding Providence wells up in my heart than pride at the attending success. During those years I were a dolt had I not learned a lesson of the "ways" of danger and safety.

In my next I will give some directions that may guide others to easier achievements than I have had in benefactions to mankind, giving some cases in illustration and proof of the truth of what I say.

To enlighten my readers as to safety (?) in sometimes (perhaps) needed full, deep and prolonged anesthesia, I am in despair, for all these years have not brought me clearness of vision, prescience of judgment sufficient to still the quiver of fear that always possesses me as I use that wonderful remedy, so potent in benediction, so terrible in destruction—chloroform—in the necessary procurement of profound anesthesia, which many surgeons seem reckless and ambitious enough to require for a display of their skill and enlargement of their fees.

The advent of antiseptics, microzoa and schizomycosis has given excuse for recklessness in operative surgery that is far from assuring to the thinking public. Laparotomies, laporectomies and twenty-six other lap—tomies, to say nothing of amputations, enucleations, luxations and orthosomatics, are advised and talked of as glibly now as “pricking a boil” or “bursting a bursa” was fifty years ago. Anesthetics have been “left a-laggin’”; and no wonder. Where is there a school of anesthesia? A man must gather from experiences of a lifetime and thousands of deaths to differentiate “heart failure” from hyper-anesthesia and become expert with anesthetics.

(To be continued.)



SOME OBSERVATIONS OF THE DENTINAL TUBULES AND THEIR CONTENTS.

BY H. G. CHAPPELL, D.D.S., OAKLAND.

The study of the dentinal tubules and their contents has occupied the time and attention of some of our foremost investigators for many years past, and still we have not yet arrived at a positive conclusion regarding their formation or their contents.

I shall endeavor to tell something of the leading theories on the subject, and show how far, by my own study, I have been able to verify the statements of the various investigators or have found things apparently opposed to their conclusions; but let it not be understood by this statement that I attempt to take the position of an authority on the subject.

My reasons for presenting this paper are, first, I believe that we cannot know too much about the tissues with which we are working. The more we know about them, the better able we will be to cope with the difficulties which daily confront us. Dr. J. Leon Williams, of London, England, who has probably done more to extend our knowledge of dental histology than any one living, recently wrote: "Other things being equal, the man who is familiar with the formation and structure of the dental tissues, as revealed by the microscope, will be a greater practical dentist than one who has only ordinary knowledge of the subject." Second, I hope that this will stimulate some of our members to investigate along these lines, and in this way our knowledge will gradually be extended.

I here wish to acknowledge my indebtedness to Dr. J. S. Engs, who has made the slides for me, thus enabling me to illustrate this paper. Some of the slides were made from sections which he prepared. I am also indebted to Dr. J. Leon Williams, as some of the slides were from copies of his illustrations. They show the points I wish to bring out better than any material I could obtain elsewhere.

In examining a section of dentine with the microscope, the first thing that attracts our attention is a great number of lines, passing from the region of the pulp canal toward the periphery. These are the dentinal tubules, containing the dentinal fibrils.

The tubules, in their passage between the pulp canal and the cementum, or enamel, curve somewhat like the line of beauty in their course. This curving is most noticeable in the crown portion

of the tooth. "The tubules are generally disposed in a direction perpendicular to the surface, so that in different parts of the tooth they radiate in various directions." They are of greatest diameter toward the pulp, gradually becoming smaller as they approach the surface, and branching dichotomously near their outer ends.

They terminate in one of three ways.

First—In the granular layer of Tomes, or interglobular layer, immediately under the cementum. [Slide.] In a few instances they may be seen penetrating this layer, thus coming into connection with the cement corpuscles.

Second—Immediately under the enamel, gradually fading out of sight. [Slide.]

Third—Fibers are seen penetrating the enamel.

Bromell, in writing on the subject, says: "The branches from the main tubules terminate in various ways, either by anastomosis, by gradually fading out into hair-like terminals, or by ending in hooks and loops. In rare instances they are said to enter the substance of the enamel or cementum, but it is doubtful if they do so normally."

I have endeavored to verify these observations, but while succeeding in some cases, I have failed in others. The penetration of the tubules into the cementum is somewhat rare, but from the sections I studied I am led to believe that they enter the enamel quite frequently, and it is here I have seen the loop-like endings, but have nowhere seen the hook-like endings. [Slide.]

Rouse seems to consider the tubules ending in the enamel as perfectly normal. He says: "When the canaliculi of the dentine (dental tubules) reach into the enamel, they always lie in the interprismatic substance. Among the Marsupialia, there are so-called enamel canaliculi, which as direct continuations of the dental canaliculi, run through the entire thickness of the enamel."

It is generally accepted that the tubules branch dichotomously near their outer ends. The question naturally arises, Why this dichotomous branching here and not elsewhere? For one seldom sees true dichotomous branching in the deeper lying portions. In a late text-book, this explanation is given: The tubules "pass toward the surface, before reaching which they become gradually reduced in size, as a result of the numerous branches which they give off." It appears to me that the author has unintentionally

given out an erroneous impression, as it would lead one to suppose that the tubules grew out into the formed dentine, and then branched as a tree or shrub, while we know that they are formed in just the opposite manner.

Some authors assume a fusion of two neighboring odontoblasts, while Rose says that in his opinion such a fusion never takes place, and has certainly never been observed.

It is a well-known fact that, as age advances, the dentine increases in thickness at the expense of the pulp, which consequently decreases in size. Therefore, some provision must be made for a removal of odontoblasts or a change in their form. Most writers agree that in the early stages of the deposition of dentine the odontoblasts are short, thick cells, having two and sometimes three processes, passing into the dentine, but after a considerable thickness of dentine has been deposited these cells have become changed in form, being longer, more slender, and seldom have more than one process. Rose thinks that as the cells change in form, these processes gradually come nearer to each other and subsequently fuse.

A longitudinal view of the dental tubules as ordinarily seen is shown in this slide. [Slide.]

Another and entirely different view is shown here. [Slide.] It appears as though the short lateral branches have bulbous extremities. I think that apparent bulbous extremities are in reality branches of tubules, which have been cut in cross or oblique section.

A cross section of the tubules will generally show merely as round dots [Slide], in the center of which, under favorable conditions, the dental fibrils may be seen. Sometimes a cross section will show a few of the tubules assuming a stellate form, due to the cut being made at a place where a number of lateral branches are given off. [Slide.] This shows an illustration copied from Rose, and published in the *Dental Cosmos* in 1893. It is a cross section of the dentinal tubules. The tooth was first permeated with Canada balsam, and afterward stained by the Golgi method. It stains the uncalcified ground substance black, but had no effect on the balsam which filled the space formerly occupied by the dentinal fibrils. Lateral branches are shown here in several places. It shows the dentinal fibrils as being quite small, and surrounded by a thick sheath of something that stains deeply. This is Nelman's sheath. Rose considers Neuman's sheath and the transverse process as sim-

ply uncalcified dentinal ground substance, which has experienced some chemical change, rendering it more resistant to the action of both acids and alkalies. He cites Golliker's investigations on the interglobular spaces, in which he found them equally resistant.

Besides the main tubules and the lateral branches which are so readily seen, there may also be seen everywhere throughout the dentine (when stained by the Golgi method) exceedingly numerous and delicate transverse connecting fibers. Rose says that we look in vain for these connecting branches in sections of decalcified dentine, although the true terminal branches of the dentinal tubules are all the more distinct.

Williams says: "My view is, that dentine, like bone, is formed by the deposit of an albumen-like calcific-bearing material, deposited in a framework or stroma of connective tissue, the odontoblasts performing the function in dentine-building that the osteoblasts do in bone-building."

V. Ebner and Kolliker supposed that the connecting branches of the dentinal tubules arise secondarily by a sprouting of Tome's fibrils (dentinal fibrils). Becker says that the dentine is everywhere penetrated by a protoplasmic network derived from the dentinal fibrillæ.

Mummery thinks that the reticulum is derived from the network of delicate connective tissue from the pulp.

As to the origin of the dentinal tubules and their contents, there is much diversity of opinion. Tomes, Kolliker and Waldeyer say that the fibrils arise from the odontoblasts. Bodecker says they arise from between the odontoblasts, while Dr. Andrews and Dr. Klein say that they are prolongations of a special layer of cells immediately beneath the odontoblasts.

Williams has exhibited a photograph (slide) of his work on this subject, showing that each of the gentlemen just named probably grasped a part of the truth, but not all of it. In this slide, the fibrils are clearly prolongations of the odontoblasts. The fibers appear to be composed of an outer wall with granular contents, apparently identical with the cytoplasm of the odontoblasts. Williams suggests that the outer wall is identical with the dentinal sheath. In this case, the fibril would be a portion of the cell, drawn out to the periphery of the dentine. [Slide.]

In this slide, long slender cells are shown between the onto-

blasts, from which fibers are seen to be continuous with the dentinal fibrillæ. [Slide.]

In this slide, showing the beginning of dentine formation, the odontoblasts are not yet thoroughly differentiated, but fibers are present, and can be seen passing toward the layer of ameloblasts.

[Slide.] This shows a later stage of development. Here fibers can be seen passing from the basal ends of the odontoblasts toward the center of the pulp, but the odontoblasts do not yet show any connection with the fibers in the forming dentine.

[Slide.] This is a still later stage of development. Here fibers can be seen passing from the basal ends of the odontoblasts toward the center of the pulp, but the odontoblasts do not yet show any connection with the fibers in the forming dentine.

[Slide.] This is still another stage, and the fibers can be seen passing in both directions, viz., toward the forming dentine and toward the pulp.

These tubules can be distinguished from the ordinary tubules by the ordinary methods of research. Each canal is said to contain at least two axis cylinders, which terminate between the dentine and the cementum, between the dentine and enamel, or in the enamel. In the dentine and stratum intermedium, they terminate in knob-shaped structures, which are ellipsoid or pear-shaped. [Slide.] In enamel they end in various ways, as in the dentine, or in long-drawn-out nucleated structures [Slide] in which the nerves end in one of three ways.

(a) The axis cylinder may pass through the entire nerve corpuscle to terminate in its periphery.

(b) The axis cylinder may terminate on a nucleus of the nerve corpuscle.

(c) The axis cylinder may pass through the entire nerve corpuscle, winding itself around one or several nuclei, to end on the last nucleus of the so-called corpuscle.

Rosé repeated Morgenstern's method and reached the conclusion that his end corpuscles are only areas of uncalcified dentine or enamel, through which the dentinal fibrils pass.

This slide shows the end corpuscles. I have studied them somewhat, but have not yet decided which investigator's views to accept. I have been unable to distinguish any great difference in the size,

Morgenstern describes nerve-endings in the dentine. He says, "that bundles of axis cylinders surrounded by thin medullary sheaths run into the dentine at certain well-defined places. They run in of the dentinal tubules, as described by Morgenstern.

Huber says he thinks it very improbable that any nerves pierce the dentine.

Coleman states that he is inclined to regard the odontoblasts as compared to the tactile corpuscles, Pacinian bodies, the rods and cones of the retina, and the auditory cells in the cochlea, and he believes a connection exists between the odontoblasts and the nerve fibers.

Hopewell Smith sees a marked analogy between the odontoblasts and certain epitheloid cells in the olfactory region of man and certain animals. He says that the odontoblasts are "more intimately connected with the nervous system than has hitherto been supposed, and that they must be the actual end organs of the dental ganglia of the nerves of the pulp." He does not look upon the odontoblasts as the cells instrumental in the formation of the dentine, but ascribes this function to the other cells of the pulp.

Legros and Magitot consider the odontoblasts analogous to the olfactory cells.

Sudduth accepts the observations of Magitot, viz., that the terminal fibers of the nerves unite with the odontoblasts, and sensation is transmitted by the dental fibrils to these terminal fibrils.

Bodecker says that he is unable to state whether the nerve fibers anastomose directly with the odontoblasts, but that he positively asserts that an indirect connection of the two is established by the intervening reticulum of living matter.

Huber states that the nerves in the pulp end in fine granules between the odontoblasts, or between them and the dentine. He suggests that pain caused in excavating a tooth is caused by laceration and the injury of the dental fibrils, resulting in some metabolic changes being set up, which may liberate heat, or some chemical product, which may stimulate the nerve.

Williams, in an endeavor to get a better knowledge of the contents of the dentinal tubuli, carefully drew the pulp a short distance from the dentine in some of his sections, and in this way succeeded in showing a number of fibrils passing from the pulp into the tubules, and clearly demonstrated that all the fibrils are not the same in

structure. [Slide.] He is very cautious in his conclusions, and all that he says in explanation of this condition is that this suggests that the fibers entering the dentine are derived from more than one source.

From this review of the work and beliefs of various observers, it will be seen that no positive conclusions have yet been reached as to the origin or the contents of the dental tubuli, or their function.

One thing seems clear, and that is that these tubules, or the fibrils, have a nutritive function, not only supplying the dentine with nutriment, but also the enamel. The proof of this is that a tooth which has been devitalized from any cause is far less resistant to decay than one having a healthy, living pulp. The enamel is more brittle, breaking or chipping much easier than before. The dentine yields more readily to the action of bacteria, and when it is cut, there is a peculiar musty odor to it, which can be readily recognized. Rapidity of decay in this case may possibly be explained by assuming that when the pulp is intact and healthy, the contents of the dentinal tubuli resist the invasion of bacteria, but when the pulp is dead, their contents are either liquefied or disappear in some manner, leaving a clear road for the bacteria to pass along. Caries of dentine progresses most rapidly in the direction of the long axis of the dentinal tubules.

Another proof of the nutritive function of the fibrils is that, as age advances, there is an increase of mineral salts in the dentine, as in other tissues of the body, and if these salts are not deposited by the dentinal fibrils, how are they deposited?

Another clinical fact must also be taken into consideration. It is a well-known fact that the teeth of pregnant women are prone to decay. This may be caused by at least two things. First: The saliva is generally acid in reaction at this time, and this acidity may cause a disintegration of the calcium salts in the enamel, and thus give entrance to bacteria. Second: There may be a softening of the tooth substance, by the fibrils taking away calcium salts from the tissues to assist in forming the osseous portions of the embryo.

Brubaker says that there is a noticeable loss of calcium from both teeth and bones of pregnant women.

Another function that seems to belong to the dentinal fibrils is the appreciation of stimuli, or conduction of sensation. Very little sensation, if any, is experienced in cutting through the enamel, but

on nearing the dentine, sensation is generally apparent, and frequently severe pain is experienced in cutting through the region occupied by the granular layer and the termination of the dentinal fibrils.

How is this sensation conveyed to the place where it can be appreciated, if not by the contents of these tubuli?

Then comes the question, whether nerve fibrils are present in the dentine, or whether these fibrils that seem to be prolongations of the odontoblasts, and probably of some connective tissue cells, are capable of conveying nervous impulses.

As we have seen before, Huber, who has spent considerable time and thought in investigating the subject, denies that any nerve fibers penetrate the dentine.

If we concede this function to the connective cells of the pulp, we are brought face to face with a great mass of evidence that goes to prove that this faculty is only held by cells of ectodermal origin, and while these cells (odontoblasts) have assumed an epithelioid form, yet it has been quite definitely proven that they are of mesodermal origin.

It is true, that the hard and fast lines that have been drawn between tissues derived from either of the three primary layers are being assailed, and it seems very probable that our views on this subject may have to be modified somewhat. Yet our present state of knowledge is such that we do not feel at liberty to state that the odontoblasts are capable of performing this function. Yet the fact remains, that the function is performed; but in what manner we are unable to say.

There is still plenty of work ahead along these lines for careful, conscientious, skilled observers, and the honor of definitely proving the origin of the dentinal tubules, their contents, and the manner in which their functions are performed is still held out to those who will work hard for it.

DISCUSSION.

Chairman Platt: Gentlemen, you have listened to the reading of the paper. I believe the discussion was to be opened by Dr. L. Van Orden. His camel balked somewhere on the other side of Market street and he couldn't get up this way.

Dr. W. A. Knowles: Mr. Chairman—I would like to say a few words in reference to the paper. I am sorry to say I cannot agree

with all that is claimed. Dr. Chappell has justly said that there is a great difference of opinion in regard to the contents of these tubuli. Some claim that the fibrils enter the tissues and others deny it. The tubuli are very small, I believe one ten-thousandth part of an inch in diameter. The tubuli contain the fibrils and contain something else, presumably fluid. I don't think it has been fully demonstrated exactly what are the contents of the tubuli. We have thought always that there is but one tissue that conveys sensation, that is nerve tissue, that nerve tissue is only for the purpose of conveying sensation, not of supplying nutriment.

The inference from that is that that which nourishes through the tubuli is the serum or its equivalent. The odontoblasts, as I understand, are only organs of repair of tooth tissue. I have never heard of their having the power of conveying sensation as some of the remarks of the paper seem to imply. The connection between the odontoblast and the fibrils would imply that there is a conveyance of sensation through them. The odontoblasts, as I understand, are for the purpose of producing a secondary formation of hard tissue within the teeth by a deposit in the outer layer, gradually hardening, forming new tissue and finally becoming obliterated, while some remain as minute spaces.

Dr. Chappell speaks of salts being deposited by the fibrils. I cannot conceive of nerve fibrils having anything to do with the deposit of salts. The fibrils, as far as I have been taught or learned, have no such function as the deposit of salts. He also speaks of the nutritive functions of the fibrils. I have never heard of the nutritive function of nerve tissue.

He says that acids developed during pregnancy dissolve the calcium salts.

The enamel of the tooth is the hardest organic substance, corresponding in the organic world to the diamond in the inorganic. There are but four acids known that will dissolve phosphate of calcium. They are oxalic, tartaric, succinic and sulphuric, and are named in the order of their affinity.

I don't think any of these acids will dissolve enamel in the mouth. Another thing. It was the accepted theory at the time I studied medicine that the reason why some tissues were apparently decalcified was not from the fact that lime was taken from those tissues to be carried to another point, nature not being in the habit of tear-

ing down for the purpose of rebuilding in another part of the system, but it was simply that the normal rate of repair did not go on; it was turned in another direction; that while there was destruction going on at all times, there was no repair in this particular tissue, which accounted for the destruction of certain hard tissues during pregnancy.

The doctor used the expression, another function of fibrils "is the appreciation of stimuli or conduction of sensation." To my mind that is the one function not another. It is the only function of the fibrils. We can readily believe that the fibrils in the tubuli connect with the nerve tissue, because they certainly do give sensation to the dentine. If that is correct I believe the odontoblasts are simply to nourish the dentine, to provide for the deposit of secondary dentine.

Dr. Chappell: I would like to correct one thing Dr. Knowles states. I think he misunderstood me in stating that any nerve fibril ever deposited salts. If he understood me in that way it was wrong entirely. I know positively, as far as can be known, that nerve fibrils do not do that kind of work.

I did not say, at least I don't think I said, unless I was rattled at the time, that any nerve fibrils or nerve tissue ever deposited salts. The idea of the odontoblast being able to convey sensation was brought out by several investigators on this line. It is now generally accepted that the various epithelial cells are able to convey sensation, but the nerve fibers do not terminate in them. These cells might perhaps have fibrils passing out from them, little spurs, and by means of the irritation of these cells sensation is conveyed through the nerve fibrils, through the protoplasmic material surrounding these cells, and in that view conveying sensation where it can be appreciated. It is only in their relation or in their position that they would be able to do it. I do not state positively that they can.

Dr. Engs: Mr. Chairman—I was very sorry to have left out the slide Dr. Chappell spoke about. It was a very nice one. It was one prepared from a specimen of his own preparing.

ADVANTAGES OF THE CLINIC.

BY F. W. BLISS, D. D. S., SANTA CRUZ, CAL.

Through the kind invitation of your committee and our worthy president I take great pleasure in presenting you a short paper on "Advantages of the Clinic." Our president in his address has aptly said, "Let our light so shine that in the near future all reputable practitioners of California will be of our number at these annual gatherings." Nothing would suit us better than to have all of the reputable dentists within the borders of our state holding a membership with us, taking an active part and each bearing a share of the burdens and pleasures that fall to the lot of a live, progressive dental society.

What shall we do to make these fellows on the outside feel that they cannot get along without us? Keep still and ask, "Why don't you join us?" And the answer comes, "Oh, I don't know." When we do know and know full well that the real reason is that our association is not sufficiently attractive. Let us "get next to ourselves" and improve the California State Dental Association on genuine professional business lines, beginning with the clinic.

The clinics carried on in our state society and other kindred associations are a sort of practical post-graduate school, which no progressive dentist ought to deny himself. In them we get the latest, best and most practical ideas from the leaders of our profession. With the special training of the modern dental college the graduate is launched in his professional career with a fitness that will secure to him the coveted realization of his most sanguine expectations. But this foundation, although a good one, and just what is needed, is not alone all that is necessary to keep him in the front rank of his profession. For a few years he may think that he does not feel the real need of the help that may be derived from professional association with his confreres, but gradually the feeling will come that "I'm not up in this and that branch as I should be." To supply this want is one strong reason for the existence of our association.

There never was a period in the history of our country when the requirements of the public bore down upon our profession as it does to-day, and each decade calls for greater dental skill.

We meet here annually as a dental body to give and take, to tell of the new things that have come to us during the past twelve months, by experiment and experience, also to absorb the good

things that may be of interest to us. We want most to see how the operation is done, and next to be able to do it ourselves. Our profession is ever on the march of improvement. It is no place for a laggard. Dr. Ottolengui says of the New York Odontological Society, "A new method of managing the clinic was inaugurated and proved to be a tremendous success, the announcement attracting many more than the usual number, while the demonstrations were made doubly satisfactory. The clinicians operated in the regular meeting room of the society, giving their practical demonstration in the usual manner, after which those in attendance were invited to take seats, while the clinicians, one at a time, orally explained the features and details of their operations. This not only made everything much more intelligible to the members and guests, but afforded opportunity for questions and discussion, so that instead of the ordinary clinic, at which only the lucky few near the chairs obtained any real information, the whole affair resolved itself into a most practical dental meeting."

I think this plan most excellent and earnestly urge its adoption by this association. In addition to this change I would suggest a plan for our mutual benefit. It is this: Let committees be appointed to carry on experiments during the coming year, for example, with a certain class of filling material, such as cements or amalgam, with the view of proving their quality for the purpose for which they are used; another committee on treatment of blind abscess. With a definite object in view I believe the work done by these committees will prove a source of great value to our association. In the past we have trusted in a large extent to the manufacturers to make the experiments, and each lays superior claims for his wares. Did you ever look at the railroad maps issued by the different companies between Chicago and San Francisco and find that each map represents that railroad as being the only short and direct route between the two points, when in fact there is only one shortest route? These maps remind us of the manufacturers of dental materials, who misrepresent their goods.

To prosecute experiments of any character it necessarily takes much time and money, and it would not be out of place for our association to make small appropriations to cover cost of material and other necessary expense for these committees of investigators.

If these committees bring the results of their experiments to our annual meeting we will then have something new, something worthy of our time and best attention. I predict an attendance and an interest in this society that will be a credit to our association.—*Proceedings California State Dental Association.*

SOME NEW THINGS UNDER THE SUN.

It is no doubt true that there is no new thing under the sun; but to unsophisticated humanity some things seem new.

The extraction of high grade Ethyl alcohol from wood is new to us. Of course the alcohol has been there all the time and chemists knew it and have tried to get it out. They have succeeded in doing so in laboratory experiments, but it remained for Alexander Classen of Aachen, Germany, professor of chemistry in the Aachen Polytechnic School, a leading chemist of Europe, to devise a process by which Ethyl alcohol may be obtained from wood and that very economically.

Of course we all know that what is termed wood alcohol has been long obtained from wood and that it has a large place in the arts, but it is not alcohol at all obtained from the sugar of wood by distillation, but is properly a wood spirits obtained by an altogether different process. This so-called wood alcohol—Methyl alcohol—may be obtained from the wood after Ethyl or what we know as grain alcohol has been taken out. This Ethyl alcohol from wood is identical with grain alcohol in all its characteristics, only that it is much freer from fusil oil, and may be used in medicine and liquors the same as grain alcohol, while the wood alcohol we have known is a rank poison when take into the human system.

Now the distillation of Ethyl alcohol from wood is not from wood brought from the forests for the purpose, but is made from sawdust and shavings and other waste products of wood-working mills, and there is an endless and inexpensive supply of such material as we know. In fact, it is often a problem with owners of extensive mills how to dispose of slabs, edgings, trimmings and sawdust. So far as it can be done this waste is burned under boilers to make steam, but after that there are tons and tons to be got rid of at more or less expense, to say nothing of the expense in the first place of hauling to the mill just so much surplus material. Here is a way of utilizing the entire log, for without a great deal of expense a plant on the grounds near the mill may be established that will utilize this refuse, first in getting Ethyl alcohol, after which the wood waste, less cellulose, is still valuable for fuel. Or it may be pressed without an agglutinated binder, such as tar or pitch, into briquettes. These briquettes may be made into high-grade charcoal if desired,

and if this is done in retorts the by-products obtained are wood or Methyl alcohol, acetate of lime, wood tar, etc.

A long ton of dry sawdust (any kind of wood) will produce about 50 gallons of proof alcohol, or about half as much absolute alcohol. Thus the waste of any wood-working mill may be turned into profit.

The discovery of Prof. Classen is a process of converting cellulose into sugar. When this has been done the usual distillation process produces the alcohol. As alcohol distillation may not be done except under the close government regulations, the mill owner would simply need a plant to make cellulose and to convert that to sugar, at which stage it would be marketable to distillers. Alcohol produced in this economical way may come to be used more extensively in the arts and especially in producing economical heat for all sorts of vapor engines. Its value is well known in this respect if it can be produced cheaply enough to compete with other things now used but not as desirable.

RADIUM.

One of the most marvelous discoveries in the world's history is, no doubt, radium. No substance ever produced is of such stupenduous interest and importance to scientists, possessing, as it does, such puzzling characteristics which seem so at variance with well-established scientific theories as to the constitution of matter. The leading scientists of the world are striving to find some satisfactory explanation of its mysterious energies. None of the theories which up to the present have been advanced satisfactorily accounts for all the phenomena due to radium.

Here is a substance which from the moment of its creation begins to give off practically perpetual light. Preparations have been made in a dark room and kept there for two years, and during that time have not lost their luminosity in the slightest degree.

The radioactivity of radium seems to be from one-half to the full velocity of sunlight rays and is carried through all matter. The walls of the room and the clothes of those who are present are all radioactive due to the presence of radium. If tubes of radium be wrapped with cotton or some such covering and held in the dark the entire mass becomes brilliantly phosphorescent, due not to the light passing through, but to the fact that cotton has become radioactive.

None of the rays from radium can be reflected, refracted or polarized, showing they are not mere light waves. The radio-energy of this puzzling substance is said to be continuously active for at least 30,000 years, and that is practically perpetual.

Another stupendous thing about it is the price. The lowest market quotation to date is \$2,721,555.90 per pound. It will be some little time, we may presume, before the fakirs will be exhibiting its wonderful phenomena to the public gaze, or peddling out luminous scarf pins, studs and collar buttons made of it.

R. B. T.



EDITORIAL

THE FOURTH INTERNATIONAL DENTAL CONGRESS.

The Fourth International Dental Congress promises to be an epoch in dental history. The committee on organization has been authorized to proceed with their work, which is to organize the congress, and various important committees are in the process of organization.

The distribution of the chairmanships of the various committees will probably be governed by geographical importance. A few important committees have been placed in the hands of Chicago dentists.

So far as we know the most important chairmanships as yet assigned are: Chairman of committee on clinics, Dr. C. E. Bentley; chairman of committee on operative dentistry, Dr. C. N. Johnson; chairman of committee on essays, Dr. G. V. Black. That these appointments are the result of wise counsel no one will doubt.

The wonderful success of the recent Odontographic Clinic was largely due to the efforts of the above-named gentlemen, and this fact no doubt largely governed the committee in making their choice.

The organization and arrangements of the clinical feature, embracing in scope as it does the entire world, limited only by the boundaries of civilization, will be gigantic. That Dr. Bentley will be equal to the occasion we firmly believe.

But to secure the success of the congress the assistance of the profession in general will be necessary and is earnestly desired by the committees. If each individual member of the profession will do his share the success of the meeting will be assured.

It is taking advantage of such opportunities that has made the profession of dentistry conspicuous as having advanced with greater strides than any profession under the sun.

Let us all do what we may for the advancement of science and the alleviation of human suffering.

Personnel of committee of organization of the Fourth International Dental Congress:

H. J. Burkhart, Batavia, N. Y.	J. Y. Crawford, Nashville, Tenn.
E. C. Kirk, Philadelphia, Pa.	M. F. Finley, Washington, D. C.
R. H. Hofheinz, Rochester, N. Y.	J. W. David, Corsicana, Tex.
Wm. Carr, New York.	Wm. Crenshaw, Atlanta, Ga.
W. E. Boardman, Boston, Mass.	Don M. Gallie, Chicago, Ill.
V. E. Turner, Raleigh, S. C.	G. V. I. Brown, Milwaukee, Wis.

A. H. Peck, Chicago, Ill.
J. D. Patterson, Kansas City, B. L. Thorpe, St. Louis, Mo.
Chairman committee of organization,
H. J. Burkhart, Batavia, N. Y.
Secretary committee of organization,
Edward C. Kirk, Philadelphia, Pa.

THE TENNESSEE STATE DENTAL ASSOCIATION.

The Tennessee State Dental Association will hold its annual meeting on Lookout Mountain July 23, 24 and 25. A large attendance is expected. From the program the profession is promised a great number of interesting papers and clinics.

GOES TO VANDERBILT UNIVERSITY.

The Department of Dentistry, Vanderbilt University, feels it has reason to be congratulated upon the acquisition of D. M. Cattell, D. D. S. (University of Michigan), as professor of "Clinical Dentistry and Supervisor of Technique" in its faculty. Dr. Cattell has of late been the teacher of operative dentistry in the University of Illinois, Chicago. He is looked upon by the dental teachers of America as one of their best exponents, both as teacher and dentist. He goes to Vanderbilt to give his entire time to his work and will add strength and culture to its dental faculty.

INDIAN DENTISTS.

The Indian(a) dentists held a state pow-wow at Indianapolis June 30 and July 1 and 2. Chief Kalo-Harry presided. Byram-John was the great hustler of the occasion, ably assisted by Hacker-Tom, Hunt-George, Jamison-Alex and other Indians, some from other villages. There were gathered together some 250, all in war paint. They were decidedly not good Indians, for the only good Indians are dead ones. We didn't see a dead one there. They were, so to speak, in contra-distinction to the dead ones, the real genuine Red Devils, for no tribe that we know could have whooped it up to the visiting warriors with more untiring vitality.

Their wise (?) men had said, however, "Let no visiting warrior buy fire-water." That was our only sorrow—we couldn't "buy." At every attempt a tomahawk gleamed in the air, and as we did not want to be scalped or numbered with the "good" Indians, we submitted as gracefully as we could to the inevitable and contented ourselves with a gourd of buttermilk now and then when we went over to Columbia wigwam for cow meat. Some warriors came from the distant tribes of Baltimores and Atlantas and made heap big talk. If there were any good Indians it was after we left after a three days' ghost dance, and then they were only half good.

A METHOD TO AVOID THE CHIPPING OF PORCELAIN TEETH IN SOLDERING.

Having had a great deal of trouble with plate teeth chipping at the incisal and approximal edges from borax in soldering, I have been experimenting in the hope of overcoming this, and I find the following plan to be most effectual:

After the teeth are ground and backed I coat the porcelain facings with a rather thick coat of ordinary sperm oil and then wax up. When the case is properly waxed, recoat the facings freely with oil and invest. When the wax is removed apply oil to the investment where borax is likely to penetrate, then heat up and solder in the usual manner. In all instances I use a camel's hair brush with which to put the oil on.

By following the procedure here indicated I find my failures lessened fully 90 per cent.—*O. E. Wall, Cosmos.*

A NAPKIN POINT.

There is one point that perhaps some of the younger men have not had demonstrated to them, insignificant, perhaps, but useful. If it is desired to keep dry a left lower tooth for ten, fifteen or twenty minutes, act as follows:

Fold or roll a napkin into a strip one and a half inches wide and not less than seven or eight inches long. Have the patient raise the tip of the tongue to the roof of the mouth. Place the end of the napkin against the lingual surfaces of the right lower teeth and pass it across the mouth under the tongue to the lingual surfaces of the left lower teeth. Let the tip of the tongue be depressed. Pass the remainder of the napkin back across the mouth from left to right, this time over the tongue. Stand to the right and in front of your patient. Place a cotton roll between the cheek and left upper teeth to occlude the parotid duct. Hold the tongue firmly down against the floor of the mouth with the fingers of the left hand, the thumb being under the chin. The lower fold of napkin occludes the submaxillary and sublingual ducts and the upper fold enables the operator to hold the tongue down without it slipping. The whole secret of success lies in keeping the tongue firmly down against the floor of the mouth. The patient may at first make unconscious spasmodic efforts to raise the tongue to swallow, but if it is held to place these efforts will cease.

For keeping dry the right lower teeth reverse the operation.—*G. E. Hunt, Brief.*

A SUGGESTION IN ROOT FILLING.

I find that in treating root canals a very good method in filling them is to saturate the canal with chloroform, taking a gutta-percha point and placing it in the root. The chloroform will dissolve the point, and I believe in this way I can fill the apex of the root more perfectly than with chloro-percha. I do not believe that it is possible to introduce chloro-percha well into the apex of the root without at times having air bubbles there, which you do not get if the chloroform is placed in the canal first. I have followed this method in a great many cases and I believe it gives a more perfect filling than the chloro-percha.—*W. E. Hayes, Cosmos.*

AN AID IN SECURING A GOOD MATRIX FOR INLAYS.

BY HENRY BARNES, CLEVELAND, OHIO.

To secure a matrix for inlay work place the platinum foil in the cavity, then take a strip of celluloid film, such as is used in photography, being careful to strip off the silver coating, bring the film around the tooth over the platinum matrix material and hold firmly. Then, through the film, burnish the matrix into the cavity. The film being transparent permits of perfect sight of work and at the same time holds the matrix in place.—*The Dental Summary.*

Tetanus from Carious Teeth.—*El Siglo Medico* of February 2, 1903, describes a case of severe tetanus which developed suddenly in a young man with no apparent portal entry. The presence of three carious teeth and the patient's habit of picking his teeth with pins, etc., suggested that a cavity in the teeth might be the focus of infection. The physician had them drawn at once and the mouth thoroughly disinfected every morning under chloroform. The case terminated in recovery.—*J. A. M. A.*

DENTIST'S OFFICE ROBBED.

By means of a duplicate key thieves got into the office of Dr. Mark D. Leonard of Buffalo, N. Y., June 10, and stole a quantity of gold used for dental purposes.

AN INCIDENT IN PRACTICE.

BY H. W. BOON, D. D. S., CHAMPAIGN, ILL.

I will give a bit of my own experience that may help some one else.

On Friday about 4 o'clock I extracted several roots in lower jaw. The bleeding stopped at the time, but some time during that night it started. The patient, awakening about 2 o'clock, went to a physician, who could not stop it, and as the fellow had soaked his pillow and shoulder of gown with blood, he was beginning to feel weak from the loss. The physician then telephoned me and I met the patient at the office at once. I tried first nitrate silver solution, 40 per cent, per chloride of iron, alum solution, very cold water, giving each plenty of time to have effect, but he was a real bleeder and they would not check the hemorrhage only for an instant. As a last resort, for I did not like to burden him with it, I placed a plaster impression on the bleeding part, adding plenty of salt to harden the plaster quickly, removed the tray, a partial one, then placed a piece of wax on top and had him keep a slight pressure on it. The hemorrhage stopped at once.

I broke the plaster and removed it about ten hours later and the tissues were healing nicely.—*Dental Summary.*

PRACTICAL POINTS.

BY J. R. HERZOG, D. D. S., NEW YORK.

A sure method of preventing base rubber from running into the gum-pink is to take care in packing and flasking to have the vents made only at the back of the flask. Close the flask carefully, when packed, bringing the front part down first, then carefully and slowly bringing the back part of flask together. This causes all surplus rubber to run into the vents at the rear of flask, leaving the front portion of pink rubber just where it was first placed in packing.

To Remove Rubber from Between Necks of Teeth.—Broken burs may be sharpened to a very fine point and can be successfully used to remove all small pieces of rubber that have lodged between the necks of the teeth used in the construction of artificial dentures.

To Replace Broken Plaster Teeth on Model.—When a plaster tooth or crown is broken from a model the best way to replace it is to drill a hole about one-eighth of an inch in both model and the broken tooth, forming a pin of cement after you have placed cement on both parts and correctly placed them. The cement used for this purpose should be mixed very thin.—*Dental Summary.*

BUSINESS CHANCE.

A good opening for a hustler. I wish to sell out; have a nicely furnished office and nice practice in one of the best small towns in central Michigan. Have been established a year and a half. I am going into a manufacturing business. Will make terms right to right party. Address F. E. S., L. O., care AMERICAN DENTAL JOURNAL.

FOR SALE.—DENTAL PRACTICE and part of dental outfit; western Indiana. A BARGAIN. Address "Southern," care of AMERICAN DENTAL JOURNAL.

**DR. R. E. DAVIS.**

Dr. Ralph Edmund Davis died of typhoid fever July 10 at Cleveland, Ohio.

He was born at Minerva, Ohio, Jan. 15, 1877, and obtained his education in the Cleveland public schools, after which he took up the study of dentistry at the Western Reserve University. He graduated with high honors with the class of 1902. In November of last year he opened offices in the Schofield building, and, although he had practiced only a few months prior to his death, he won a host of friends and a large practice through his kindly disposition and affable manners.

DR. DENTON E. PETERSON IN ORIENT, FORMERLY OF NEW YORK.

A cable message received by the family of Dr. Orton W. Peterson from the United States consul at Tien-Tsin, China, under date of June 24, announced the sudden death of Dr. Denton E. Peterson, a prominent resident and dentist of that city, on June 23. The deceased was well known throughout this section, having practiced dentistry in Waterloo, N. Y., for several years prior to his leaving for China some eighteen years ago. He had offices at both Tien-Tsin and Hong Kong, and had attained a wide reputation as a most skilled dentist during his long residence in China, and, at the time of his death, was the only American dentist in China.

DR. J. W. HECKLER.

Dr. John W. Heckler, one of the best known dentists in Buffalo, died June 16 at the Sisters' hospital from blood poisoning caused by an injury to the ligaments of his leg sustained while boarding a car. While on the back platform of the car Dr. Heckler lost his equilibrium. He managed to hang on to the car, but in doing so severely sprained his leg and knee.

He was removed to his home, which was near the scene of the accident, and although the injury caused him considerable pain, it was not believed to be serious. There being signs of blood poisoning, Dr. Roswell Park advised the removal of the patient to the hospital, where he died.

Dr. Heckler had a large circle of friends in Buffalo. He was a member of DeMolay Lodge, A. F. & A. M., Marine Lodge No. 633, I. O. O. F., and the B. P. O. E. He leaves a widow and two children.

DR. GEO. M. MERRICK. SUCCUMBED TO APPENDICITIS.

The sudden death of a bright young dentist, Dr. George M. Merrick, occurred at Harper hospital, Detroit, June 26. The deceased was well known and had just opened an office after graduating from the dental department of the Detroit College of Medicine. He was taken ill with appendicitis and succumbed before an operation could be performed. What made the young man's death particularly sad was the fact that he was engaged to be married to Miss Edith Reeves. The marriage was to take place in the fall, and the young man had a promising future. Most of his friends and acquaintances and classmates did not even know that he was sick.

DR. WM. A. LYON.

The Dental Society of the District of Columbia held a special meeting and passed resolutions expressing the regret and sorrow of the members sustained by the death of their fellow-member, Dr. William A. Lyon. The resolutions were prepared by a committee composed of Drs. H. C. Thompson, S. G. Davis and T. J. Jones. It was decided that the society should attend the funeral in a body. The proceedings of the meeting were ordered engrossed and sent to the family.

Dr. Harry Mack, a dentist of Aberdeen, S. D., died June 14. The cause of his death was pneumonia, resulting from a cold. The young man was 22 years old and leaves a mother.

NOTICES OF MEETINGS

CORRECTED INFORMATION REGARDING RAILROAD RATES TO THE NATIONAL DENTAL MEETINGS AT ASHEVILLE.

The rate of one fare plus 25 cents made by the Southeastern Passenger Association is a round-trip rate and is only good in territory east of the Mississippi and south of the Ohio.

From all other territory the rate to Asheville is one and one-third fare on the certificate plan.

Purchase full fare to Asheville and secure a receipt entitling to return at reduced rate.

Sale of going tickets July 21 and 22, and July 25 and 26.

J. D. PATTERSON,

Chairman Executive Committee National Dental Association.

A CORRECTION.

THE AMERICAN DENTAL JOURNAL:

Dear Sirs—I notice in your June number you publish on page 410 the Tennessee Dental Board of Examiners.

You made a mistake; that is the Arkansas board. I know because I am a member of that board.

S. L. RIVERS, D. D. S.

NORTHERN INDIANA DENTAL SOCIETY.

The Northern Indiana Dental Association will hold its annual meeting at Wabash, Ind., on the 15th and 16th of September, 1903.

J. A. STOECKLEY, Secretary.

COLORADO STATE DENTAL ASSOCIATION.

At the annual meeting of the Colorado State Dental Association, held in the Brown Palace Hotel, Denver, Colo., June 16, 17 and 18, many interesting papers were read and clinics presented. The following officers were elected for the ensuing year: President, Dr. E. W. Varley, Pueblo, Colo.; vice-president, Dr. F. Y. Herbert, Denver, Colo.; treasurer, Dr. Wm. Smedley, Denver, Colo.; secretary Dr. Harry W. Bates, 237 Majestic building, Denver, Colo.

HARRY W. BATES.

NATIONAL DENTAL ASSOCIATION. MEETS AT ASHEVILLE, N. C., TUESDAY, JULY 28.

Preparations are being made for one of the best meetings in the history of the association. The section officers are preparing a program which, from a scientific and practical standpoint, will be difficult to excel. The clinics will be made a special feature.

All dentists interested in the advancement of the profession should attend this meeting.

All state and local societies should elect delegates who will be sure to attend the national meeting, they being entitled to one delegate for every six of their members.

The usual railroad rates will be had on all roads in the United States and part of Canada—one fare and a third, on the certificate plan.

A. H. PECK, Rec. Sec'y.

L. G. NOEL, President.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-third annual meeting of the Wisconsin State Dental Society will be held at West Superior, Wis., July 21, 22 and 23, 1903. The usual railroad rates will be obtained. The profession is cordially invited to be present.

T. M. WELCH,

President.

W. H. MUELLER,

Secretary, Madison, Wis.

MINNESOTA STATE DENTAL ASSOCIATION.

Lake City, Minn., July 1, 1903.

Frink & Young, Publishers, Chicago, Ill.:

Dear Sirs—The twentieth annual meeting of the Minnesota State Dental Association will be held at the Dental Department of State University in Minneapolis on Tuesday, Wednesday and Thursday, September 1, 2 and 3. All dentists are cordially invited to attend.

GEO. S. TODD, Secretary,

Lake City, Minn.

IS THE OLDEST IN THE WORLD.

The Northern Ohio Dental Association is the oldest dental society in the world. It has been an active organization since 1860. It has numbered as members some of the most noted dentists of the country and at the present time has a membership of 233.

At the annual meeting, held June 2, 3 and 4, there were about

250 dentists present and amongst the number there were four of the original charter members. They are Dr. D. R. Butler, Cleveland, Ohio; Dr. Corydon Palmer, Warren, Ohio; Dr. J. T. Siddall, Oberlin, Ohio; Dr. Jonathan Taft, Ann Arbor, Mich., formerly of Cincinnati.

Ohio has the honor of having the oldest dental society in the world, also the second oldest dental school, Maryland having the first.

THE MINNESOTA STATE BOARD.

The Minnesota State Board of Dental Examiners met at the office of Dr. Orton, St. Paul, June 23, and awarded license to the seventy-one applicants for permission to practice dentistry in Minnesota.

Fifty-one of the applicants passed the examination held some three weeks ago. Of this number thirty-one are graduates of the University Dental College.

MARYLAND STATE DENTAL ASSOCIATION.

The twenty-fifth annual meeting of the Maryland State Dental Association was held June 24 at Baltimore. The following were elected officers for the ensuing year:

President—Dr. W. G. Foster.

First Vice-President—Dr. A. C. Brewer.

Second Vice-President—Dr. H. E. Kelsey.

Corresponding Secretary—Dr. F. F. Drew.

Recording Secretary—Dr. W. W. Dunbracco.

Treasurer—Dr. S. C. Pennington.

NORTHERN IOWA DENTAL SOCIETY.

The ninth annual meeting of the Northern Iowa Dental Society will be held at Clear Lake, Iowa, Sept. 1, 2 and 3. The society will make a special feature this year of a school of porcelain art, under the supervision of Dr. J. A. Prothero of the Northwestern University Dental School. The several other strong numbers on the program will make this meeting one long to be remembered.

C. L. TOPLIFF, Sec'y.

UNIVERSITY OF MINNESOTA.

The commencement exercises of the College of Dentistry University of Minnesota was held at Minneapolis June 4, 1903. The degrees were conferred by Cyrus Northrop, L. L. D., president of the university. The list of graduates follows:

Joseph Theodore Ahlstrom, St. Peter; C. La Due Amundson, St. Peter; Albert Christian Bosel, Henderson; Jay Hugh Burns, Stewart; James Robert Cain, W. Concord; Claude Lynn Cole, Fergus Falls; Samuel Lewis Conley, Cannon Falls; Michael Francis Cook, Faribault; Norman Llewellyn Davies, Minneapolis; Judson Leroy Day, Clinton Falls; Albert Ray Foster, Winona; Frank Anton Frankoviz, Fergus Falls.

Degrees conferred by Cyrus Northrop, L. L. D., president of the university:

Lewis Gholz, Roscoe; Henry Erwin Goodspeed, New Richmond; Hans Christian Hektner, Mooreton, N. D.; George Edwin Hourn, Minneapolis; Walter Clyde Huestis, Minneapolis; Gustavus Adolphus Kuncke, Henderson; William Frederick Lasby, Northfield; Franklin Elmer Moorhouse, Minneapolis; George Jay Pattison, Herman; Ernest Francis Peterson, Minneapolis; Jay Nelson Pike, Lake City; Frank Prendergast, St. Paul; George Dwight Smith, Minneapolis; Cecil Chester Sparrow, Ortonville; William John Spring, Madison; James Francis Trench, Denison; Lewis Edward Tuck, Minneapolis; Oscar Sidney Werring, Sleepy Eye; Harold Warren Whitcomb, Rollis; George Davis Williams, Willmar; Orlando Bigelow Wood, Blue Earth; Frederick Spencer Yaeger, Helena, Mont.

NORTHERN OHIO DENTAL ASSOCIATION.

The forty-fourth annual meeting of the Northern Ohio Dental Association opened June 2. The morning session was taken up entirely with the reading of the annual report of President J. F. Stephan and some old miscellaneous business of small importance. In the afternoon at 2:30 o'clock Dr. Harry L. King of Wellington, O., read a very interesting paper entitled, "Some Observations Concerning a Dangerous Drug with the History of an Unusual Case." The drug under discussion was arsenic and it was shown by the papers read that the drug was a most dangerous one to handle in connection with the work of the dentist.

Dr. F. F. Chapman of Cleveland read a paper bearing on the methods employed in the making of a bi-cuspid crown. Drs. F. L. Miles and M. C. Ramaley, also of Cleveland, gave short addresses on the same subject. In the evening the annual election of officers was held, at which the following members of the associations were chosen to fill offices: President, Dr. W. H. Fowler, Painesville;

vice-president, Dr. W. T. Jackman, Cleveland; corresponding secretary, Dr. W. G. Ebersole, Cleveland; recording secretary, Dr. C. D. Peck, Sandusky; treasurer, Dr. D. A. Allen, Toledo.

Following these elections the regular program for the evening was resumed, when Dr. J. W. Hisey of Cleveland spoke on the "Anamolies of Second Dentition" and Dr. C. R. Baldwin discussed the "Use of a Few Valuable Drugs in Dentistry."

THE SOUTH DAKOTA DENTAL ASSOCIATION.

The South Dakota Dental Association held its annual meeting in Redfield June 3, 4, 5. The dental board was in session for two days prior to the opening of the association meeting and held the regular examinations.

On Thursday morning S. E. Morris gave the address of welcome in behalf of the city and was responded to by L. F. Straight of Desmet. The president, Dr. D. St. I. Davies of Woonsocket, made his annual address.

The following officers were elected for the ensuing year: President, Dr. C. E. Stutenroth, Redfield; vice-president, Dr. E. S. O'Neil, Canton; secretary, Dr. J. W. Ross, Milbank; treasurer, Dr. W. H. Jackson, Flandreau; librarian, Dr. D. St. I. Davies, Woonsocket. The president, vice-president and secretary, with the following, make up the executive committee: Dr. A. W. Fossum and Dr. J. A. Scheuter, both of Aberdeen.

There was a lively contest between several towns for the meeting in 1904, but Aberdeen won out over Sioux Falls by a large majority, and the next meeting will be held in Aberdeen the first Wednesday in June, 1904.

MASSACHUSETTS SOCIETY CONVENTION.

The annual meeting of the Massachusetts Dental Society was held in Boston June 3, 4, 5. The following officers were chosen:

President, William P. Cooke of Boston; first vice-president, Frederick S. Belyea of Brookline; second vice-president, John J. F. McLaughlin of North Adams; secretary, Edgar O. Kinsman of Cambridge; treasurer, Joseph T. Paul of Boston; librarian, Thomas W. Clements of Brookline; editor, Frank A. Delabarre of Boston.

It being late before the business session closed, the annual address of the president, Dr. Andrew F. Flannagan, was postponed until afternoon.

The remainder of the morning was devoted to a paper on "The Effect of Diseases of the Air Passages Upon the Teeth," by Dr. A. G. Minshall of Northampton. A discussion of the paper followed.

Dr. Frederick S. Belyea then illustrated with photographs a case of "Reduction of Protrusion in an Edentulous Mouth by Artificial Dentures."

Dr. R. Rankin Stubblefield of Nashville opened the afternoon session with an address on "Sanitology," Dr. Charles C. Patten spoke on "Porcelain in Operative Dentistry; a Fad or a Fact?" and Dr. Luther D. Shepard of Boston on "Prospect and Retrospect."

About the banquet board at the Lenox, in the evening, 110 persons, which included members, their wives and the invited guests, were seated. Dr. Andrew J. Flannagan president. The speakers of the evening were Dr. Edwin T. Darby of Philadelphia, who spoke on "Dentistry"; Miss E. A. Kimball of Worcester, who talked on "The Economies of Life," and the Rev. Philip S. Moxom, whose subject was "The Main End."

MISSOURI STATE BOARD.

Dr. Burton Lee Thorpe of St. Louis and Dr. S. C. A. Rubey of Clinton were elected president and secretary of the State Board of Dental Examiners at Jefferson City at the semi-annual meeting for the examination of applicants for dental certificates.

Dr. H. J. Vaughan of Kansas City was elected a delegate to the National Association of Dental Examiners. Seven applicants took the examination before the board, and of these three passed, as follows: J. A. Johnson of Houston, W. T. Tivy of St. Louis and C. P. Strawn of Paris.

The North Carolina State Dental Society elected the following officers:

President—J. M. Fleming, Raleigh.

First Vice-President—J. A. Gorman, Asheville.

Second Vice-President—J. B. Little, Newton.

Secretary—J. S. Betts, Greensboro.

Treasurer—R. M. Morrow, Burlington.

Essayist—P. E. Horton, Winston-Salem.

The convention adjourned at one o'clock to meet at Morehead City next year. The exact date will be decided later.

PERSONAL AND GENERAL

Dr. Geo. Shand has located at Gobleville, Mich.

Dr. Geo. Miller, formerly of New Albany, Ind., is now located at Dayton, Tenn.

Dr. Philip Monroe is now located at Markle, Ind.

Dr. Charles R. Flatt has opened an office at Dwight, Ill.

Dr. O. H. Gallagher has located in Des Moines, Ia.

Dr. I. C. Crowell has opened an office at Shell Lake, Wis.

Dr. J. A. Hutchinson of Chicago has opened an office in Toledo, Ill.

MARRIED

Dr. G. Burke of Detroit to Miss Florence Treble.

Dr. O. S. Groff to Miss Louisa Clark at Wyandotte, June 16th.

Dr. Homer Beals Hawley of Salamanca, N. Y., to Miss Arrah Giles of Randolph.

Woodson T. Smith, dentist of Geneva, Neb., and Miss Jessie L. Clark were married in June.

Dr. A. D. Hockman, formerly of Charleston, Ill., is now located in Chicago.

Dr. E. F. Wagner, formerly of Prescott, Wis., is now located in Stewartville, Minn. This leaves Prescott without a resident dentist.

Dr. Elvira Castner of Marienfelde, near Berlin, who was one of the first German women to come to this country to study a profession closed to her in Germany, has given up her profession of dentistry after many years of successful work and is devoting herself to a school of horticulture for women founded by herself. There are now a number of women dentists in Germany.

DENTIST SUED FOR A DEATH.

Charged with having performed an operation on a patient so carelessly that blood poisoning and death resulted, Dr. James F. Hasbrouck, a dentist, in New York city, has been made the defendant in the Supreme Court in a suit for \$25,000 damages. The complainant is William Heath of Louisville, Ky., father of Eugene May Heath, who died on May 7, 1902, in that city.

The tooth from the extraction of which the blood poisoning is said to have resulted was removed on April 5, 1902. Dr. Hasbrouck, in his answer to the complaint admits performing the operation, but makes positive and sweeping denial the blood poisoning was owing to any negligence or carelessness on his part.

*JURORS FIND THAT L. I. THOMPSON DID NOT OVERCHARGE
EDWARD GRADY FOR DAUGHTER'S TEETH.*

A Supreme Court jury to-day decided that the sum of \$527.50 is not an exorbitant dentist's bill for straightening the teeth upon a child's upper jaw. The dentist is Dr. Larmar I. Thompson, and the man who has to pay the bill is Thomas Grady. The amount allowed is the full sum for which Dr. Thompson sued.

Dr. Thompson was engaged for 221 hours in his work upon Florence Grady's teeth, and charged the father \$2.50 per hour. Mr. Grady said the sum was exorbitant, and declared that he had an arrangement with Dr. Thompson by which the bill was not to exceed \$300. The dentist produced his books in court, and had seven casts showing the condition of the child's teeth when he began work and when he finished. At the first, one of the teeth stood at right angles to the others, and he was also compelled to enlarge the jaw to get some of the teeth in place.

DENTIST'S LICENSE IS TO BE REVOKED.

After a hearing that lasted the entire day, the state board of dental secretaries decided to recommend that the certificate to practice of Dr. Selim E. Worster, dentist, be revoked, because of unprofessional conduct.

The recommendations were forwarded to the State Board of Health at Lincoln, Neb., and word was received that the board will act on them and revoke the certificate.

The dental secretaries, Drs. A. L. Meese of Lincoln, J. R. Wentz of Plattsmouth, and W. N. Dorward of Omaha, conducted the hearing. At the morning session the testimony showed that Worster practiced outside the profession of dentistry, and "made" work by filling sound teeth. The board reached an immediate conclusion on the recommendations.

DENTAL SCHOOL MAY JOIN RUSH.

Negotiations are on between Dr. E. Fletcher Ingalls of Rush Medical College and Dr. Truman W. Brophy, president of the Chicago College of Dental Surgery, looking toward the affiliation of the dental school with Rush as part of the medical department of the University of Chicago. The plan is part of the general scheme of closer union of the medical school and the university, conditioned upon the raising by the Rush trustees of \$1,000,000 before July 1. Dr. Ingalls said last night that everything looked favorable for the securing of the money. Commencing next fall the course in the Chicago College of Dental Surgery is to be four years, an innovation in the west.

FOR SALE—Dental office and fixtures, North Side, Chicago; 7 years' established; business of \$4,000 per year cash. Address J. O. C., care AMERICAN DENTAL JOURNAL.

The action of Mrs. Mary E. Martin of Creedmore against Edw. Dillman, D. D. S., of Jamaica, N. Y., to recover \$2,000 damages, was tried

before a jury in the Queens County Supreme Court at Long Island City June 22. The jury returned a verdict for defendant.

Mrs. Martin asked for damages because of an injury to her face, due, she claimed, to improper treatment of a tooth by Dr. Dillman. The defendant introduced expert testimony to show that the injury complained of could not have been caused by any lack of skill or neglect on his part, and swore that he had successfully treated a number of ulcers from which the plaintiff was suffering, but that one broke on the outside of her face and caused the scar of which she complained.

CLASS OF 1903, SCHOOL OF DENTISTRY, UNIVERSITY OF
ILLINOIS.

Lysle Edwin Adams, Conrad Frederick Altenberg, Edward Walter Applegate, Steven Richard Bawden, Alfred Alexander Broman, John Henry Bond, Harry Cadwallader, John Oscar Erlands, Charles Alfred Finley, Leo Gottlieb, Arthur Raymond Greenfield, Harlow Henry Hill, Edward Alphonso B. Hanna, Francis Albert Holly, Edward Hulla, Oscar Jacob Hammersmith, Elmer Nichols Johnson, William Henry Karcher, Joseph Daniel McElroy, Alfred Leland Harlan Mann, Tekla Maturzynska, James Emmet Monahan, Martin Guy Murray, Alden Richard Newlin, Veo Erwin O'Neil, Semour Davis Paden, George Fred Palmer, Wm. Morton Post, Guy Stanley Peck, Nick Peter Rasmussen, Frank John Ryan, John Edward Reinbold, James Scott, Frederick Holstein Swartz, Thomas Harvey Sprague, Frank Murray Stahl, William Frank Taylor, William Henry Taylor, George Horace Wardner, Charles Edward Waterman, Jr.

DENTISTS WON SUIT.

Mrs. Evelyn Johnson of Jamestown, N. Y., about a year or so ago went to the dental firm of Swetland & Anderson to have her teeth extracted. Dr. Anderson of the firm administered gas, propped her mouth open in the usual way and proceeded with the operation. There were several teeth. The last dropped in her mouth and it was supposed lodged in her throat. The prop also disappeared.

Mrs. Johnson claimed the tooth and prop lodged in her throat and did a large amount of physical injury. She accordingly brought an action against the firm for damages. The matter was referred to Hon. C. D. Davis of Salamanca and that gentleman after taking several volumes of testimony has at last reached the conclusion that the dentist was blameless and that Mrs. Johnson can not recover. He also finds that the tooth she presented in court was not the tooth that was lost. Naturally the dental firm is much pleased over the result of the litigation.

IDENTIFIED BY TOOTH.

JOHN WILKES BOOTH'S BODY RECOGNIZED THREE YEARS
AFTER DEATH.

The story that John Wilkes Booth, under an assumed name, had been living in the west until last March, when he committed suicide, which has

been recently printed, has once more called attention to the identification of the body of the supposed murderer of Lincoln by Edwin Booth and Junius Brutus Booth in Baltimore three years after his death. One of the few living witnesses of that identification is now in New York, and recently he told the graphic story of the occasion.

This witness is Frank Oakes Rose, an actor and stage manager by profession, a lifelong friend of James O'Neill. He is at present stage manager for the Pain Fireworks Company, and will produce "The Last Days of Pompeii" at Manhattan beach this summer. He is also a member of the board of directors of the Actors' Society of America.

"At the time of the identification," Mr. Rose said, "I was a member of Ford's stock company at the Holliday Street theatre, in Baltimore. There was an undertaking establishment, surrounded by a high fence, just opposite the stage door. One morning as W. E. Burton, a fellow player and a friend of J. Wilkes Booth, and I were about to enter the stage door for a rehearsal Burton seized my arm, cried 'Come with me, quick!' and pulled me across the street.

"We scaled the high fence about the undertaking establishment and dropped down on the inside. Standing back to us were a score or more people, including two army officers, Edwin Booth and Junius Brutus Booth, Thomas A. Hall (last year with James K. Hackett), our stage manager, and Mr. Ford. They did not see us, but waited in silence in front of the door of the place. Presently the door opened and they filed in, we after them. The room was darkened, and two dim gas jets flickered at either end. In the center, on two horses, was a plain coffin, not moldy, but evidently dug up from a long confinement in the ground. It was unopened. I got near the head, close to Edwin Booth.

"I can identify my brother, John Wilkes Booth, by a gold plugged tooth on the right side of his jaw, next to the eye tooth," said Edwin Booth, and the coffin was then opened. The remains of a man evidently long dead were disclosed. Edwin Booth and the undertaker examined the skull, and found the gold plugged tooth just as the former had described. All the teeth were fine, white and strong, and the jaw was unmistakably that of the Booth family; even I could see that, who did not know John Booth personally. The body was shod with a riding boot on one foot and a slipper on the other. Burton then spoke up. 'That boot looks like a pair John used to wear when we went skating,' he said. 'If it is one of the pair, there will be a hole in the heel made by the screw of the skate.'

"The boot was examined and the screw hole found. There was no doubt in the mind of anybody present that the body was that of John Wilkes Booth, and we then filed out. I have never at any time since heard one of those then present express the slightest doubt as to the completeness of the identification.

"Once I had the misfortune to refer to that day to Edwin Booth, and I shall never forget it. I was engaged to play Horatio with him, and as we stood in the wings I asked him if he remembered me. He said he did not, and I stupidly told him where we had first met. His face underwent a horrible change. Then he said slowly: 'Oh, yes; that was a sad occasion, Rose!' After a long pause, he added: 'I am as well acquainted with you now as I ever was with my brother John. He was so peculiar I never seemed to know him.'"

THE DENTIST'S STORY.
THE TALE OF A LOCK OF HAIR.

BY H. N. LANCASTER, D. D. S.

Every June for many years the old dental college, near the great hospital, has turned out a large class of dentists, each with the coveted diploma and many varied hopes and expectations for the coming years, to work out their own destiny in the world. And with the passing years time, at once the great healer and the great executioner, has made many changes both in the school and among the many dentists it has started on their professional careers.

The building has become moss-grown. The stairs are worn almost half through, and the old gas fixtures seem to belong to our ancestors rather than to us. It has been some years since dissecting has been done in the old dissecting room, and since the students have been going over to the hospital for that purpose the old room, oddly enough, has been changed into the college lunch and smoking room. Still it is not so odd after all, for what is there in this life that is not made up of various combinations, in infinitely various proportions, of the pathetic and the droll?

And it was in this smoking room, on the occasion of the annual reunion in 1902, that little groups of members of the various classes since 1875, with shoulders more or less bent and hair more or less gray, were talking together of their college days spent in that very building many years ago.

There were only two professors left of the corps that constituted the faculty at its foundation. There were Dr. Hicks, professor of anatomy, and Dr. Woodworth, professor of pathology, and it was the latter who one day asked the class of '77 why men were more prone than women to gout, and it was Biddle of the class of '77 who answered:

"Because they do more night work." After that day Biddle was always known among the students as "Night Work Biddle," and here it might be well to state parenthetically, as there is an eternal fitness of things, that Biddle's nocturnal tendencies might have had to do with at least making the name binding.

In the group of a half dozen or so of the class of '77 who were sitting near the east window was Garretson, who, through some mistake, had for some years been marked "deceased" in the annual announcement. Garretson had not been to the annual convention for some years, and during the day when the old friends of college times shook hands with him they did so in that respectful, solemn way that one would assume in exchanging greetings with a ghost. The "ghost" has announced that he will soon issue a monograph on "The Life and Experiences of a Deceased Dentist."

Some of the class had died, some had left the profession after a few years' trial, some had prospered and married and become fathers of grown children, and some as bachelors reasoned it all out by their private systems of philosophy to the justification in their minds of their condition.

Barton of Pennsylvania drew great draughts from his pipe, the same pipe he smoked at college, and which pipe being sacred he smoked only at conven-

tions, and returning home packed it snugly away until the next reunion. When Barton smoked he smoked in that almost enthusiastic way, completely enveloping himself in great clouds, and that afternoon, fondling the shiny bowl with those long, tapering fingers—matchless fingers for a dentist—between the puffs, in slow, reminiscent speech, he began this tale:

"If you remember, gentlemen, I was elected class historian and was to do my little stunt at the banquet in the evening of the day we graduated. But I didn't wait. I just made a bee line for the depot, and in three days was back in my state again, and with horse and buggy making short trips from town to town and from village to village—a traveling dentist. I worked at this for about nine months, and was getting sick and tired of it, when I chanced to run across 'Night Work Biddle.' Biddle was doing the same thing, and as he stood in about the same mental attitude to it as I did myself, we made up an agreement out on the hotel porch one evening to locate somewhere and go into partnership.

"We looked around for a while for a location, and at last settled in M—, a town, at that time, of about 15,000. It was rather a tough time at first for two of us, but by and by things began to come our way and we were doing nicely till, when we had been in practice for about three years, Biddle died; and, curious as it was, died during an attack of gout. Well, about six months before Biddle died, one evening he told me of a queer case he had during the day. It seems that a dreamy, sentimental sort of chap came in and wanted a large molar cavity filled with gold and when Biddle was ready to put in the gold the young man reached into his vest pocket and pulled out a piece of yellow wrapping paper, unfolded it, took out of it a little lock of wavy brown hair and timidly lisped to Biddle through the rubber dam, asking him if he could put the lock of hair underneath the gold. Biddle in his practical way told him that it would save some gold anyway, and so the lock of hair was sealed up in the tooth.

"Just about eight months after Biddle died a young man came in to me to have a molar tooth crowned, and when I took out a gold filling that was in it to prepare it for a crown out sprang a tiny curl of hair. Instantly I remembered Biddle's patient, but didn't let on for a moment. I showed it to the young man and asked him what he wanted done with it. He told me with an indifferent shrug that could not be taken for anything but a decided symptom of a radical change of heart to throw it away. I gave it a toss out of the window, but in such a way that it caught in a pot of plants on the window sill, and after he'd gone I got it and put it in the gold drawer. It was a little ringlet of the prettiest wavy brown hair I ever saw, and often after I used to try to imagine what the girl who wore it really looked like.

"One Sunday some months after, when I was in church, I found my eye riveted upon a young woman sitting in front of me. Her hair was neatly done up on the back of her head in a graceful coil and was of the same wavy brown as the little coil in my office, except that here and there, where the sun had kissed it a bit too ardently, it had taken on a lighter tint. The next Sunday I took along the little lock from the gold drawer and sat myself down

in the same seat. Soon in came the young lady and sat directly in front of me. Upon the pretense of reaching forward for a hymn book I placed the lock of hair close to hers. They were identical. When she passed out of the church I got a glimpse of her face and was quite surprised to find it much as I had pictured it in my imagination many times, only still more handsome.

"That winter I was introduced to her.

"Now, gentlemen, over there, standing by the table, is my son—just got through last year—that young fellow with the high collar. Here you see that little curl of hair in this 'locket. The boy's hair is that same wavy brown, but his mother's is a little grayer now than when this piece was cut."—*Chicago American* by permission.

ALBA, PA., DENTISTS SUED.

A suit has been brought against George C. Courtright and Dr. William Powell of the Alba Dental company, charging them with conspiracy to defraud Mrs. Margaret H. Manderville of Stanwick, N. J., of \$25. Both defendants were held in \$800 bail for court.

The prosecutrix testified that on May 11 she went to the Alba dental rooms, at Tenth and Market streets, being allured by advertising and signs which read: "No students employed." She paid \$25 for dental work. Dr. Smyth extracted her teeth, and she was then fitted for an upper set of teeth by Louis Solomon. The latter, she said, told her a root of a tooth remained in her jaw. He pulled this out on May 22, and then found it was piece of her upper jaw. Since then her jaw has been under treatment of Dr. Bennett, and has had continual gatherings and discharges.

Louis Solomon testified that he was a freshman student at the Pennsylvania Dental college, having been there one year. He had been employed at the Alba place several months, and performed the operation on Mrs. Manderville. Frank A. Gordon, a junior at the same school, testified he had been employed by the Alba company from April 15 to June 5.

The prosecution asserted that a conspiracy existed between Mr. Courtright and Dr. Powell to defraud the public by untruthful advertising, and also to employ students as dentists, in defiance of the state laws on this point.

The magistrate continued the case to be decided by a higher court. Charles L. Smyth appeared for the prosecution and Charles Downing for the defendants. In a subsequent proceeding, Louis Solomon gave bail in the sum of \$500 for court, charged with practicing dentistry without being a graduate.

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